UNIVERSITY OF UTAH
COLLEGE OF NURSING
MASTER PLAN

Prepared for:
University of Utah Facilities Planning and
Campus Design and Construction

Project Number:
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Prepared by:
ajc architects
703 east 1700 south
salt lake city, utah 84105
801 466 8818

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University of Utah

College of Nursing Master Plan

Salt Lake City, Utah
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Review Signatures

This Master Plan Document was prepared jointly by the University of Utah College of Nursing, Campus Design & Construction, Facilities Planning, Space Planning, ajc architects and consultants.

We have reviewed this Master Plan Document and we agree that it adequately reflects our mission and master planning needs. All appropriate parties representing the University have reviewed it for completeness and accuracy.

Maureen Keefe — 8/1/05
Maureen Keefe — Date
Dean, College of Nursing

James Bardsley — 7-26-05
James Bardsley — Date
Associate Vice President, Office of Sr VP Health Sciences

John McNary — 7/22/05
John McNary — Date
Project Manager, Campus Design and Construction

Bruce Gillars — 7/26/05
Bruce Gillars — Date
Associate Director, Space Planning & Management, Health Sciences

Michael R. Perez — 7/27/05
Michael Perez — Date
Associate Vice President, Facilities Management

PARTICIPANTS

The following is a list of individuals and groups represented during the Programming Process.

University of Utah

Tami Cleveland	Facilities Planning
John McNary	Project Manager, Campus Design and Construction
Bruce Gillars	Associate Director, Space Planning & Management

Steering Committee

Linda Amos	Associate Vice President, Health Sciences Center
Susan Beck	Associate Dean for Research and Scholarship, College of Nursing
Catherine Coda	Assistant Dean for Finance, College of Nursing
Beth Cole	Division Chair, Professor, Director-Hope and Comfort Grief Program, Health Sciences
Carole Gassert	Associate Dean, College of Nursing
Sue Huether	Executive Associate Dean, College of Nursing, Interim Director-Center on Aging
Maureen Keefe	Dean, College of Nursing
Mae Kramer	Division Chair, PhD, RN

Program Architects & Consultants

Jill Jones	ajc architects
Elizabeth Blackner	ajc architects
Mehrdad Samie	ajc architects
Jeff Miller	Reaveley Engineers (Structural)
Win Packer	WHW Engineers (Mechanical)
Dave Wesemann	Spectrum Engineers (Electrical)

Steering Committee Support

Carmelle Wilde	Executive Assistant to the Dean, College of Nursing
Sherry Higley	Executive Secretary, College of Nursing

Technology Focus Group

Wayne Peay	Director, Spencer S. Eccles Health Sciences Library
Carole Gassert	Associate Dean, College of Nursing
Sandra Haak	Associate Professor, Learning Resource Center Director
Katherine Sward	Clinical Instructor

Academic Leadership Team Focus Group

Maureen Keefe	Dean, College of Nursing
Carole Gassert	Associate Dean, College of Nursing
Catherine Coda	Assistant Dean for Finance, College of Nursing
Beth Cole	Professor, Director-Hope and Comfort Grief Program, Health Sciences

Nursing Faculty Focus Group

Becky Christian	PhD, RN
Valerie Flattes	MS, APRN
Lynn Hollister	MS, RN
Connie Madden	MS, RN
Patricia Pearce	PhD, APRN
Nancy Pulsipher	MS, RN
Paula Siciliano	MSN, APRN, GNP
Lee Walker	PhD, RN
Helen Zsohar	PhD, RN

Student Focus Group

Shanni Baraki	Undergraduate Student
Linda Edelman	Graduate Student
Madeline A. Linares	Graduate Student

Community Focus Group

Nancy Giles	Development Board, Chair
Diane T. (Dinny) Trabert	Development Director, College of Nursing

College of Nursing Staff Focus Group

Deb Boulter	Media Coordinator
Rebecca Craven	Coordinator of the Learning Resource Center, College of Nursing
Shayla DeGooyer	Academic Course Support Specialist
Christina Echeverria	Program Administrator
Carrie Radmall	Manager, Office of Academic Affairs/Student Services
Bob Turner	Manager of Grants and Contracts

Follow-up Focus Group

Linda Amos	Associate Vice President, Health Sciences Center
Bruce Gillars	Associate Director, Space Planning & Management
Barbara Polich	Development Board
Sue Huether	Executive Associate Dean, College of Nursing, Interim Director-Center on Aging

Campus Design and Construction, Plant Operations

Lowell Fullmer	Supervisor, Electric Shop
Dave Henry	Director, Campus Utility Services
Dave Kosanke	IT Telecommunications
Brian Nielson	Director, Buildings and Grounds
John Atkins	Supervisor, HVAC Shop
John McNary	Project Manager, Campus Design & Construction
Terry Walters	Supervisor, Systems Operations Shop

College Description

Overview

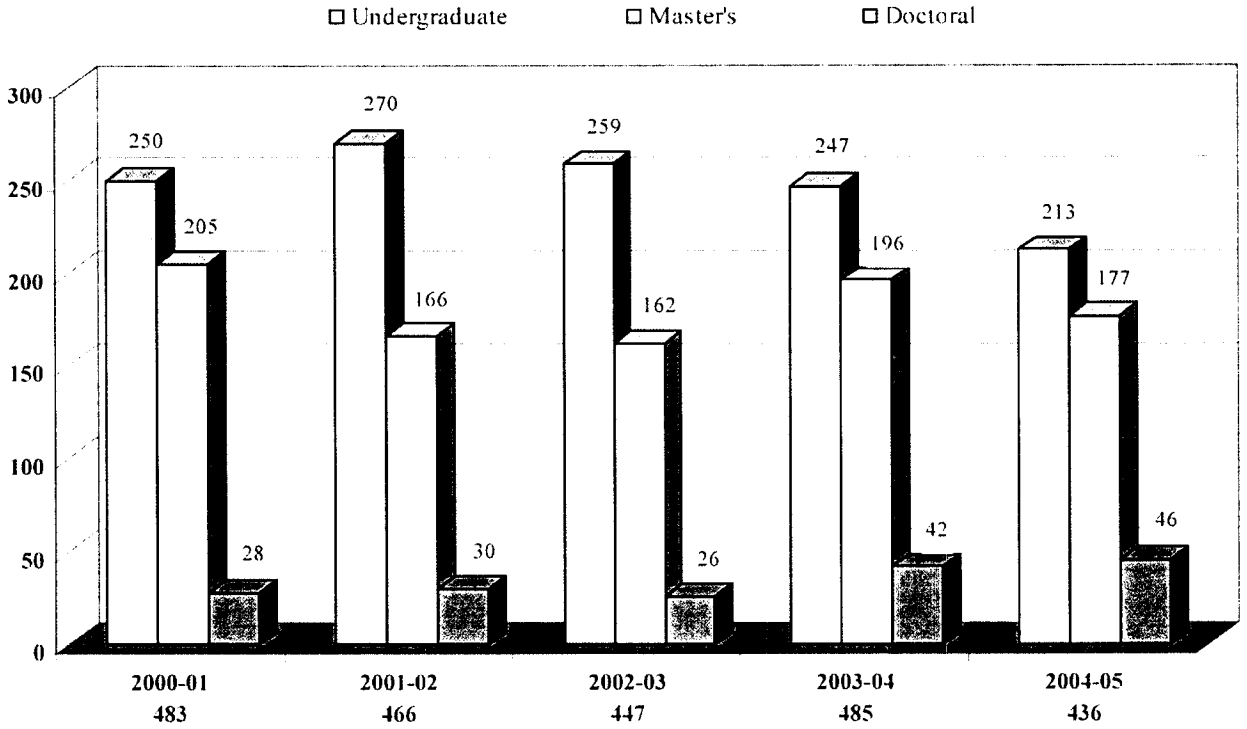
The College of Nursing is experiencing growth and success in all the missions of the University of Utah including; education, research, practice and service.

Education

Figure A shows the total enrollment of baccalaureate and graduate students Fall Semester over the past five years. Due to the base budget cut in FY 02, admissions to our baccalaureate program were capped at fifty students each semester, for a total of 100 basic students. The enrollment in our RN-to-BS Program has steadily increased to a cohort of 50 students each year. Our transition to the four-semester upper division baccalaureate curriculum and year-round study option with summer graduation decreased the enrollment count for Fall 04.

Enrollment growth targets for the coming year include: 64 baccalaureate students each semester, for a total of 128. Enrollment in our RN-to-BS Program will steadily increase to 64 students. Graduate enrollment for students with teaching emphasis or cognate will increase to 25 students. The total enrollment target for the master's program is 250 students. Doctoral enrollment will be maintained at 50 students for FY06.

Figure A Student Enrollment 2000 - 2005 (OBIA)



Graduate enrollment has remained fairly stable. The decrease in graduate student enrollment in the 2001-02 year was due to the completion of a rural outreach grant to educate nurse practitioners in medically underserved areas. These 22 students graduated in May-August 2001 and are currently

practicing in rural areas through the state. This federal training grant was resubmitted and funded during 2003. Growth in the Doctoral Program is a reflection of the addition of the distanced-based PhD in Oncology Nursing Program.

Figure B Number of Graduates 2000 - 2004 (OBIA)

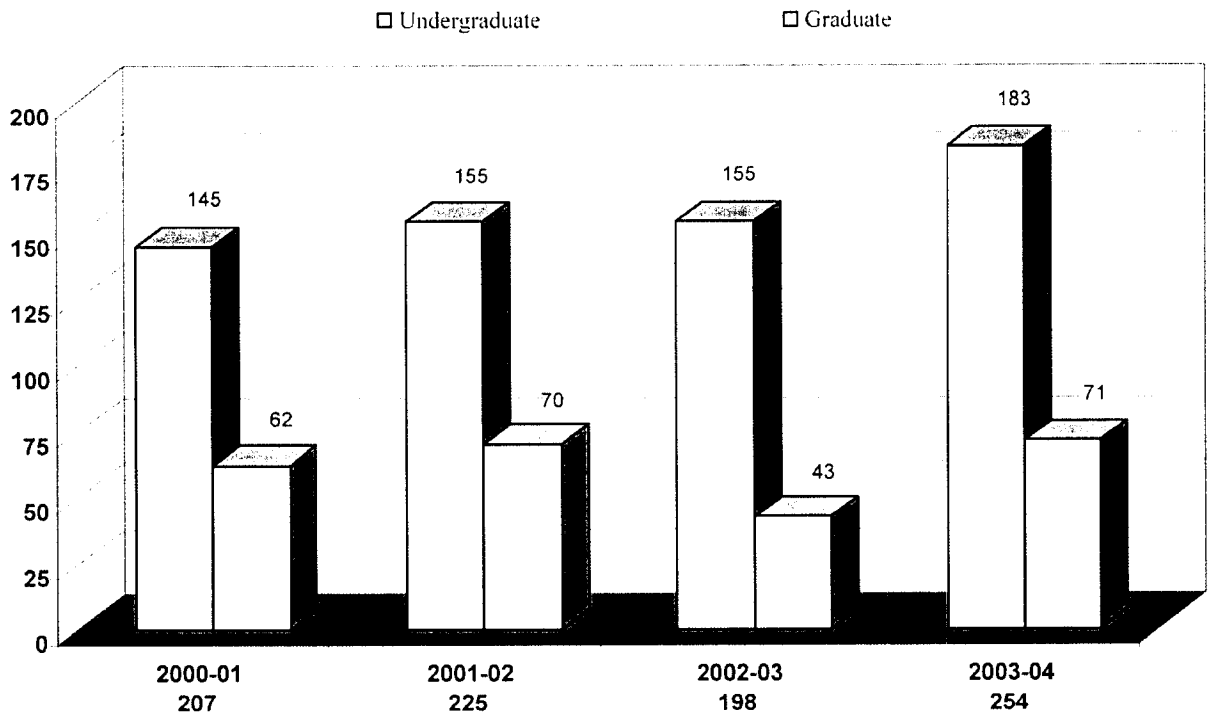


Figure B depicts graduation rates for students completing the upper division Baccalaureate and RN-BS Programs (undergraduate) and graduate programs (MS & PhD combined). The increase in Baccalaureate graduates during the past year is a reflection of the one-time program acceleration to expedite the transition from the old 5-semester curriculum to the new 4-semester curriculum. The College of Nursing continues to see consistently high (95%) completion rates across all programs for nursing students.

Surveys of our graduating seniors from Spring, Summer, and Fall Semesters of 2004 indicated that most of our baccalaureate graduates continue to live and work in Utah following graduation; 120 surveys were sent and 68 students responded (57%). Ninety-six percent (of the 68 students) indicated that they had full-time job offers in Utah within hospital settings. Ninety-six percent of the students indicated they accepted full time positions in the area of their preference.

The College of Nursing was successful in obtaining additional federal funding to support our education programs, student funding and special projects.

U of U Center on Aging

The Center on Aging continues to offer both a certificate and master's program in Gerontology. The educational programs are delivered through online and in-class course offerings. The Gerontology Certificate Program is entirely web-based, which enhances access and enrollment. Yvonne Sehy

added GERON 6604 (Physiology and Psychology of Aging) on-line beginning Fall 2004. For the 2004-2005 academic year there were a total of 457 students enrolled in Gerontology courses, which compares to 412 for 01-02, 363 for 02-03, and 449 for 03-04. We anticipate that enrollments will hold steady for academic year 2005-2006. Adjunct faculty continue to teach many of the courses. Dr. Michael Caserta received NIA funding for a research (RO1) grant, "Recently Bereaved Spouses: Living After Loss," in the amount of $369,374 direct costs for the first year and an overall total of $2,295,578 for five years of funding.

The Center on Aging also initiated a new seminar series, "The Interscience Research Seminars on Aging." The seminars were held in the School of Business CRCC Building for easy access. The seminars were organized with an interdisciplinary planning team and supported with funds from Jerry Kaplan, PhD, Associate Dean for Research, School of Medicine, and Assistant Vice President for Basic Sciences.

Research

The College of Nursing (CoN) is strategically positioned to become a research-intensive academic unit within the Health Sciences Center and the University of Utah. The Strategic Plan of the CoN includes several strategies to increase the research activities of the College. These include increasing our NIH ranking based on extramural funding for research, increasing the number of faculty investigators, and increasing the number of grant submissions and funded grants. The plan also proposes that the CoN develop ways to recognize and provide rewards for success in these activities.

Within the past five years the College has launched a very successful initiative to support the submission of extramural grant applications and expand our research program. This initiative has included release time from teaching, expert consultation, statistician support and summer salary support.

We have experienced progressive success with the number of submissions and rate of funding of applications. In FY 05 we had 21 active funded research projects; two of these were intramurally-supported. In FY 05, one new RO1 was funded (Caserta), one R21 (Murphy, awaiting award letter), three new subcontracts on RO1s (Beck, Ellington, and Kinney), a new mentored research award from ACS (Ellington), an AACN small grant (Doig) and a collaborative project (Haak) with the PORC funded by industry. We were also awarded a new training grant (Brooke) from HRSA related to diversity. Intramurally, Dr. Hardin received a small grant from the University Research Committee and Ms. Burrage received a University Teaching Grant.

During FY 2005, it is projected that we will have submitted a total of 21 applications for extramural funding plus one University seed grant and one Teaching Committee grant. Several of these were resubmissions on grants that were scored favorably in the first review. We have also made a significant advance in sponsorship of doctoral fellowships. We now have two funded NRSAs (Doig, Erickson), one Hartford Geriatric Nursing Scholar grant (Lacasse), and nine American Cancer Society doctoral scholarships. A doctoral student, Emma Thoma, is submitting an application for the Graduate Partnership Program at NIH.

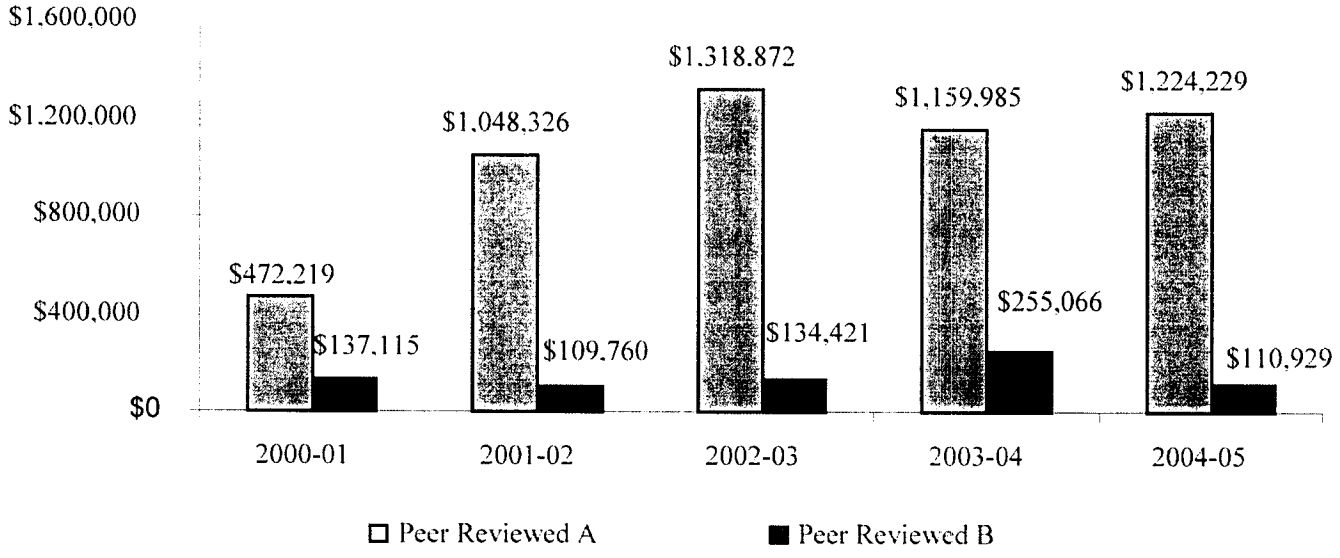
The additional support of the Senior Vice President for Health Sciences during the past four years has helped us to build the infrastructure and provide incentives to grow the research enterprise. In addition to the 15% recovered indirect costs, $100,000 of additional research support was committed for three

years beginning FY02. This was renewed in FY 05.

The College of Nursing has used both of these funding sources to provide faculty summer salary funding and establish a core service for statistical and grant management support. We have been extremely successful in using this seed money to develop an effective infrastructure and incrementally move salary support to alternate funding sources. Although we have made significant progress, we have not yet reached an adequate indirect stream to maintain our current infrastructure without some additional support.

The investment in research has yielded a steady growth in extramural research dollars over time (see Figure C). This has led to an increase in our NIH ranking for research funding among schools of nursing, from 26 to 20 in 2003. In the past year we have been able to sustain our level of funding overall but this will take a new investment. We have successfully recruited three new tenure-track faculty with promising programs of research. They will need protected time, mentorship, and rewards to succeed. With the retirement of four full professors, we will have to maintain an aggressive recruitment effort in a very tight and competitive market.

Figure C Direct Research Expenditures



Faculty Practice

Our College of Nursing practice plan and practice sites are essential to the education and research missions of the College. In addition, all of our practices exist to showcase excellence in advanced practice nursing and are committed to maintaining their own financial viability. A summary of the practice activities follows:

Youth Corrections: The contract with the Utah Juvenile Justice System will be open for bid some time

during the month of March. The contract was originally established in 2000 for three years and was renewed for two years, for a total of five years in the original contract. By law the contract will need to undergo competitive biding. The period to received bids is scheduled for March 28 to April 28, 2005, and we will be submitting a proposal as soon as we know the terms of the contract. The proposal will be submitted in cooperation with the Department of Pediatrics. Medical and nursing services would continue to be provided at five sites: Salt Lake Valley Detention Center, Genesis Youth Center, Wasatch Youth Center, Observation and Assessment, and Decker Lake Youth Center. We have been advised there will be a request for increased services so at this time we cannot anticipate the budget for the bid.
Community Clinics: Margaret (Peg) Colyar, DNSc, FNP, provides services at the UUHSC Stansbury Clinic at 20% time. It is an important primary care education site for our students. Peg is generating her salary from revenues. At the present time Peg is on budget for her revenue generation.
Psych/Mental Health: Ann Hutton, APRN, Director of the Psychiatric/Mental Health Nursing Program, practices 20%, with her offices at the College of Nursing. She averages 30 client visits per month. Ann generates 100% of her clinical salary. The caseload is primarily low-income, self-paying patients. In addition, her available practice time is limited by her other College of Nursing responsibilities and teaching assignments. The practice provides learning experiences for second-year psychiatric nurse practitioner master's students. She is currently on budget for her revenue generation.

Caring Connections: A Hope and Comfort in Grief Program continues to provide a significant number of services for individuals and families experiencing loss and grief. The program is operated cooperatively with University Hospital and Clinics. The Hospital supports one APRN who assists with leading the program. The College of Nursing supports one part-time faculty, one part-time staff and three work/ study students to assist with the support groups. During the past year, 30 support groups met for an average of 8 weeks, with a total of 200 participants.

In-hospital activities included in-service education, patient, family, and staff consultation, resource development, distribution of materials, and development of programs to improve end-of-life care. We anticipate that the services to be provided for 2005-2006 will continue with about the same numbers as for 2004-2005. The program is currently in the process of strategic planning and redefining the scope of services to be provided at University Hospital and Clinics.
Student Health Center: Three faculty providers practice at the University of Utah Student Health Center. Salary support is provided by transfer of funds from the Vice President for Student Affairs. The College of Nursing provides $14,433 in salary for Tek Kilgore. Direct salary support provided by the VP for Student Affairs for the three nurse practitioner providers (2.5 FTE) is $162,859.

In summary, 16 faculty are practicing at 10 faculty practice sites. Three sites operate on a fee-for-service basis, and the five Youth Corrections sites and the Teen Mom Clinic are contracted services.

Community Outreach / Community Service
During the 04-05 academic year, the College Council approved a faculty standing committee to facilitate and oversee the outreach activities of the college. The College of Nursing Office of Outreach coordinates the service learning, diversity, and international efforts of the college. Through coordination of these three areas of interest, the College of Nursing has been able to achieve integration of the three areas through participation in service learning programs at the international level that focus upon supporting diverse students in these activities (as well as a service-learning course project on the Navajo Reservation).

Service-Learning

The College of Nursing is proud to be the only college or department on campus to have fully integrated service learning throughout the curriculum. Five required nursing courses have been approved by the Bennion Center for recognition as service-learning courses. Nursing students are facilitated to become service-learning scholars through the Bennion Center, and thus receive recognition for their service on their graduation transcript. The College's five service-learning courses have cooperated together to design an integrated program whereby students are able to select a community agency to work with throughout the four semesters they participate in service-learning as nursing students. This longitudinal opportunity will not only provide the student with a more in-depth experience with a community partner, but will also enhance the student's ability to contribute to meeting the community agency's mission. During this academic year, three hundred and fifty nursing students provided a minimum of two hours of service per week in one of the twenty-five community agencies with which the College of Nursing has partnered. At least 21,000 hours of service have been provided to our community through service-learning projects. In addition to the service our students are providing, the College of Nursing faculty volunteer their time and service in numerous health fairs, health education presentations and community outreach activities.

International

The international outreach efforts of the College have included exchanges with Finland, Ireland, and Sweden, and participated in service projects in Mexico, Peru, and Africa. Numerous requests for international exchanges are being assessed by the Outreach Committee and facilitated as faculty resources permit. A protocol for inviting international visiting scholars to collaborate with the College of Nursing was placed on the College's website during this academic year.

Diversity

The College of Nursing has continued to be an active participant in the Health Sciences Cultural Competency training program. All undergraduate and graduate students in the College are expected to complete modules 1 – 4 of the program during this academic year. Additionally, the faculty of the College of Nursing is receiving this training also. The College has also remained actively involved in the Health Professions Academy and numerous other activities across campus which provides support for the recruitment and retention of ethnically diverse students. College of Nursing faculty consistently mentor students involved in the President's Opportunity Scholarship Program and continue to collaborate with high school services to coordinate our recruitment activities. Grant funding was received from HRSA to support the recruitment, retention and leadership development activities for underrepresented groups in nursing. This grant focuses on support for ethnically diverse students as well as students who have an educational or economic disadvantage. The grant has allowed us to hire a full-time recruiter/ counselor for our diversity activities.

Enrollment, Faculty and Staff Statistics Y2004-2005

Students	
Undergraduate:	241
Master's:	177
Doctoral:	46
Total:	436
Faculty	
Full Time Tenure Track:	30
Full Time Clinical & Research Track:	36
Part Time:	28
Total:	94
Staff	
Full Time:	36
Part Time:	14
Total:	50

Defining Statements of the College

Core Values

The University of Utah College of Nursing supports the mission and vision of the University, and is an integral part of the Health Sciences Center. We serve the public by improving health and quality of life through excellence in nursing education, research, and clinical care. We endorse the following values of the Health Sciences Center:

- Compassion
- Collaboration
- Diversity
- Integrity
- Responsibility
- Excellence

In addition, we support the values of innovation and caring.

Vision Statement

As a College, our vision is to develop leaders in nursing and healthcare whose actions, discoveries, and voices strengthen and transform the health of individuals and communities worldwide.

Mission Statement

The College of Nursing is a dynamic and evolving organization where we prepare all levels of professional nurses and scholars for diverse health care delivery and leadership roles. We offer interactive education in both nursing and gerontology. The College provides exceptional clinical care through innovative practice models. We are committed to developing knowledge that leads to improved health and quality of life.

Guiding Principles

The College of Nursing is positioned within an environment that respects the individual, fosters diversity, promotes community, cultivates life-long learning, and makes excellence an imperative. The action plans for education, research, and practice are located within the context of three organizing principles: 1) scholarship, 2) service, and 3) inclusiveness. As foundational elements, these principles inform and guide all activities for faculty, students, and staff.

Scholarship

The first organizing principle, scholarship, is defined in the broadest sense of the word, and includes the scholarship of analysis, critique, creation, and utilization. Scholarship is exemplified in excellent practice, inquiry based teaching, and the creation of new knowledge forms. Scholarly work includes publications, presentations, grant writing, and academic endeavors directed toward knowledge construction and distribution.

Service

The second organizing principle that informs all activities in the College is service. Faculty, students, and staff participate in the life and organizational work of the College and University through committees and task forces. Faculty participate in professional organizations, review panels, and service activities. As a form of service, faculty also engage in public presentations, public education, and volunteer work directed toward promoting health in individuals, families, and the community.

Inclusiveness

The third principle is organized around the cultivation and implementation of diverse ideas, perspectives, and beliefs in the College. This orientation influences the policies and practices of the College and guides student, faculty, and staff recruitment. The outcomes to be achieved and maintained by this organizing principle are:

- The development of a culturally relevant and sensitive curriculum.
- The delivery of culturally competent care.
- The creation and maintenance of an inclusive community.

Strategic Initiatives 2004 – 2007

Goals

The following four major goals form the basis for strategic planning and resource investments for the College of Nursing over the next three to five years:

1. Addressing the nursing shortage and nursing faculty shortage in Utah and across the country

   Currently we are involved in several innovative collaborative student preparation partnerships:

   - Student nurse internships
   - Post graduate nurse residency
   - Expand RN-BS options and add long-term care specialty
   - Service-Learning

   We have also expanded our faculty preparation and faculty resources through:

   - Teaching in nursing specialization track
   - Clinical faculty associates model
   - Accelerated BS to PhD program

   We will be exploring additional educational innovations to expand access and enrollments though:

   - 2nd degree options for students with degrees in other fields

- Explore Clinical Nurse Leader partnerships and affiliations
- Expand innovative models for doctoral education including: PhD specialty foci, distance options, Western Interstate Commission for Higher Education collaborations and faculty and student exchanges
- Expand tenure track faculty and funded research programs to support growth in graduate education
- Create additional Faculty Fellowships and scholarships
- Market and expand Teaching in Nursing Masters Specialty & Post Masters Certificate programs

2. Enhancing quality and access to nursing and gerontology education through innovative technology-based delivery modalities.

   Currently we lead the University in programs and courses utilizing distance technology in the following:

Web-based programs:	RN to BS Gerontology Certificate program Teaching in Nursing MS & Certificate Rural NP Program
Teleconferencing:	PhD in Oncology Nursing

   Our goal is to become know nationally for:

   - Best practices in using innovative technology and pedagogy
   - Our research initiatives in evaluation and educational research
   - Our pioneering work in simulated learning and other new technology–based teaching modalities such as IP Video and PDAs.
   - Setting the stage and role modeling best practices in the new interdisciplinary HSE building in collaboration with the Eccles Library
   - Build on our success and national notoriety for the distance based PhD in oncology nursing doctoral program and expand it to other models & other specialties
   - Creation of a Center for Simulated Learning– Critical Care and other Modules

3. Advance recognition for research through sustained extramural funding and collaborative activities

   The College of Nursing is currently ranked 20th in NIH funding out of over 500 schools of nursing in the U.S. The impressive growth in extramural funding has risen from $350,000 to $1,465,000 in the past five years.

   Our objectives in this area are to sustain faculty productivity and visibility and to:

   - Support additional clinician researcher teams/partnerships.
   - Expand portfolio and diversify grant funding sources to include funded centers, cores and institutional pre and post doctoral awards and funding from additional agencies.

- Increase number of interdisciplinary funded research projects in several foci – cancer, aging, pain, women & children (informatics & genetics)
- Explore and expand interdisciplinary research and education opportunities:
  Center on Aging/Gerontology
  Medical and Nursing Informatics
  Genetic counseling and Neuroscience
  Alternative and Complementary Healing
  Evaluation/Educational Research

4. Align our clinical and educational endeavors with Health Science Center (HSC) areas of clinical emphasis and other clinical partners' strengths and interests.

   Currently we are serving the medically underserved through our faculty practice and community outreach initiatives:

   - Expand access to services through the use of NPs in community sites and incorporate the use of telemedicine links.
   - Increase the College of Nursing presence in the Huntsman Cancer Hospital in both the research and clinical service areas.
   - Expand and promote the Center for Aging as the model for elder care regionally and nationally.
   - Expand and market our expertise in pain management, end of life and palliative care as part of the Caring Connections: Center for Hope and Grief.
   - Prepare and utilize advanced practice nurses with genetic counseling skills.
   - Integrate psychiatric mental health clinicians and services into primary care settings.

Existing Facility Facts

Year Built	Net SF	Gross SF
1968	45,097	77,461

Note:
The above numbers do not include covered (level 1) parking, subgrade parking structure, subgrade mechanical rooms, or the mechanical penthouse.

Project Justification

The existing College of Nursing Building is substandard in terms of current life safety and building code compliance. The College of Nursing should be in a building which provides seismic stability, safe emergency exiting routes, a fire suppression system, modern fire alarm system and have the proper fire separations between occupancies. As part of the next phase of the project a full life safety analysis should be done by either the State Building Board or a third party.

The mechanical systems for this building remain largely the originally installed systems. This equipment is over 35 years old and has been servicing the building and occupants well beyond its life expectancy. Consequently, the system is not operating at capacities which are required to keep building occupants comfortable. Operations and maintenance costs reflect the inefficiencies that this older system causes. The system has been characterized by University Plant Operations as a disaster waiting to happen and needs to be completely upgraded and replaced by an efficient, effective mechanical system.

Similarly, the electrical systems have been pushed beyond a reasonable term of service. The building lacks an emergency generator which would be required in a building of this size constructed today. Again the inefficiencies inherent in these older systems are causing operational problems for the building occupants and maintenance support. The building requires a complete electrical upgrade and replacement to remain a viable space for occupancy.

The College of Nursing Building will enjoy a close relationship to the adjacent and new Health Sciences Education Building (HSEB) which is finishing construction and expected to be occupied in Fall of 2005. Classrooms and other functions in this building will be utilized by the College of Nursing in a spirit of interdisciplinary interaction and synergy. Spaces in the existing College of Nursing Building may now be vacated when this building opens and is converted to more pressing uses.

The College of Nursing suffers from inefficiency due to inconvenient and disorganized space and functional adjacencies. During the length of time this building has been in operation countless changes have occurred in what now is experienced as a haphazard fashion. This project will reorganize and rezone functions in a way that will increase efficiency and security.

The building is not in compliance with the Americans with Disabilities act. Required maneuvering clearances, doorways, door hardware, rest rooms, and electrical systems need to be brought into conformance with ADA guidelines. Implementation of this master plan will allow this to occur.

This building has a severe shortage of rest room facilities for men. At the time this building was built, the nursing profession was comprised almost exclusively of the female gender. Now men in the profession are common, welcomed and recruited, yet the building does not provide them with basic services. This is unacceptable and needs to be rectified.

The College of Nursing and Health Sciences Campus is in dire need of an upgraded and expanded in-patient simulation space. The intent is that the proposed Learning Resource and Simulation Center

will be used by all of Health Sciences. The existing Learning Resource Center opened along with the building; it is no longer a state of the art facility and does not represent existing patterns of patient care units and nursing practice. While staff, faculty and students do their best to function in this facility, it also suffers from a severe space shortage with multiple activities competing for the same space. This is the most urgent need and is the impetus for this master planning effort and is part of the first phase.

The building does not have adequate office space necessary to house the faculty in an appropriate manner, which is limiting the recruitment and hiring of needed faculty. There is also not enough research space to implement the research projects on the docket. The staff complains of insufficient work space. These space deficiencies are addressed in this master plan.

Growth is anticipated. While the College is being charged with the responsibility to address the nursing shortage and educate more nurses, it lacks the space necessary to increase enrollment. Reasonable limited enrollment growth has been factored in the space need projection. This affects the learning spaces to remain within the building, and provides for associated faculty and staff support.

The proposal and preference of the College of Nursing to renovate and use their existing building is a commendable decision from a sustainable viewpoint. Building adaptation and reuse reduces the depletion of finite resources and reduces debris that would end up in landfills. This decision to extend the life cycle of an existing building conserves resources, retains cultural resources, reduces waste, and prevents the negative environmental impacts of a new facility.

This building is riddled with asbestos, which has limited the ability of the building to take part fully in the telecommunication and data changes that are taken for granted in new facilities. As the master plan project is implemented along with the fire suppression project the removal hazardous materials, primarily asbestos, will occur.

In the accreditation review performed seven years ago, the facilities were found to be at capacity and it was recognized at that time that additional space would be needed. The Graduate Council review of the College of Nursing Information Graduate Council Report to the Vice President for Health Sciences and the University Senate (dated April 14, 1997) states: "The College is housed in its own five-story building located in the University of Utah Health Sciences Center. The space for classrooms, laboratories, offices and students is heavily utilized, yet comfortable. Library resources were considered adequate although minor concerns were expressed by students.
There is also strong staff support. Growth has pushed the existing space to the limit. Plans for needed expansion of college space have been incorporated into the long-range development plan for the Health Sciences Center."

Summary of Space Need

The additional space need is projected at approximately **16,500 GSF**.

Summary Proposed Phasing and Costs

Entire Project: $19.00 Million

Phase 1: $9.11 Million

Floors 1 & 2 including new central stair, mechanical and electrical service and equipment upgrades, associated utility and site work.

For cost estimating purposes (inflation), it was assumed that this phase would be publicly bid in year 2007.

Phase 2: $9.86 Million

Floors 3-5, conversion of existing central stair to mens' rest rooms, north and south additions, landscaping and site work.

For cost estimating purposes (inflation), it was assumed that this phase would be publicly bid in year 2010.

Existing Site Description

Architectural

Location

The existing College of Nursing Building is ideally located for its purposes in the heart of the University of Utah Health Sciences Campus. The Health Sciences Campus is located to the east of the Main Campus. See

FIGURE 1: CAMPUS MAP
and
FIGURE 2: CAMPUS LONG RANGE DEVELOPMENT PLAN.

General boundaries consist of North Campus Drive to the north, Medical Drive to the west, Fort Douglas to the south and the foothills of the Wasatch Front to the east.

Long Range Development Plan and Health Sciences Education Building

The Health Sciences Campus is a combination of academic and clinical facilities, generally divided into three zones:

Academic
Clinical Care
Research

The College of Nursing Building (#588) is located in the academic zone, north of the Pharmacy Buildings and south of the University Hospital and Building 521. Demolition of Building 521, which houses the School of Medicine, clinical uses and support, is anticipated due to life safety issues. The Health Sciences Education Building (HSEB), currently under construction directly east of the Nursing Building, is scheduled to open Fall of 2005. It will replace the academic functions of 521 and is also programmed to provide classroom space and other facilities for use by all of Health Sciences, including the College of Nursing. The aim is to promote interdisciplinary education by bringing faculty and students throughout Health Sciences together in a common space.

Another impact resulting from the construction of the HSEB is that some functions currently residing in the College of Nursing Building will be relocated into the neighboring building. See

FIGURE 3: LONG RANGE DEVELOPMENT PLAN, HEALTH SCIENCES AREA.

While there are a couple of available future building sites identified in the Health Sciences area, the steering committee felt that these potential relocations offer no compelling advantage over the existing building location. It is consistent with the goals of the Long Range Development Plan for the College of Nursing to remain in its current location.

The current building offers spectacular views of the Salt Lake Valley to the west and south. Views to the north are of the clinical care elements of the Health Sciences Campus and the foothills beyond. Glimpses of the mountains to the east are possible on the upper levels, however the buildings east of

Site Circulation
Circulation patterns around the Nursing Building are shown on

FIGURE 4: VEHICULAR AND PEDESTRIAN CIRCULATION PLAN.

The primary vehicle access to the building is via Medical Drive. UTA buses, campus shuttles, and TRAX serve the Health Sciences Campus. The Long Range Development Plan for the University of Utah is to provide peripheral parking with shuttle service throughout the interior of campus. Access to lower level parking is from the west. There is a parking lot directly north of the building and under the north half of the building on level one.

Fire truck access must be maintained along the sidewalk running directly east of the building.

The pedestrian path from main campus across the legacy bridge channels people primarily to the sidewalk directly east of the building. This sidewalk is a major pedestrian access also used by those walking towards the building from student housing and those using the existing shuttle stop to the south. Students, staff and visitors arriving by automobile generally park to the east of the building and filter through the campus to the east entrance. Therefore, the east entrance is currently considered the "main" entrance.

The approach to the building from the TRAX stop to the west will likely lead people through the buildings and skywalks west and north of the Nursing Building as they work their way up the grade. Currently, access from the north is primarily from the hospital and building 521 along the west side of the library and to the east entrance of the Nursing Building. Maintaining convenient pedestrian traffic between the College of Nursing and the University Hospital to the north is crucial. At this time it is unknown how access to and from the north side of the building will occur in the future. This will depend on the development of the footprint of 521 (after demolition).

Another factor for consideration in terms of pedestrian access is a potential for the "Eccles Plaza" project to become a reality. This project is conceived to be located immediately north of the Nursing Building and directly west of the Health Sciences Library. The surface of the plaza would be at approximately the elevation of the second level of the Nursing Building and would have parking below. If this occurs then another welcoming entrance to the building on the north side will be crucial. However it is anticipated that at least the early phase of the College of Nursing master plan will be designed and implemented prior to the Eccles Plaza project which has been designed to the concept level only.

The south entrance of the building (level one) is not heavily used now. It is primarily used by the clinical functions and staff on level one. Currently, circulation to upper levels from level one is awkward and problematic. The north entrance on level one is used primarily by those using the existing parking area and level one parking. This entrance is considered the service entrance.

Currently, there is not a public entrance at the building on the west side. An under-utilized plaza exists on the west side.

Site Utilities

It is not anticipated that implementation of the master plan will significantly impact utility infrastructure in the area. There will be an increase in plumbing fixture count in the building as rest rooms for men are provided.
For locations of existing untilites in the area, see

FIGURE 5: EXISTING SITE UTILITIES PLAN.

Refer to the following mechanical and electrical site utility statements for more detailed information.

All utility capacities are to be verified during the programming phase.

THE UNIVERSITY OF UTAH

College of Nursing Master Plan - Figure 1

Campus Map

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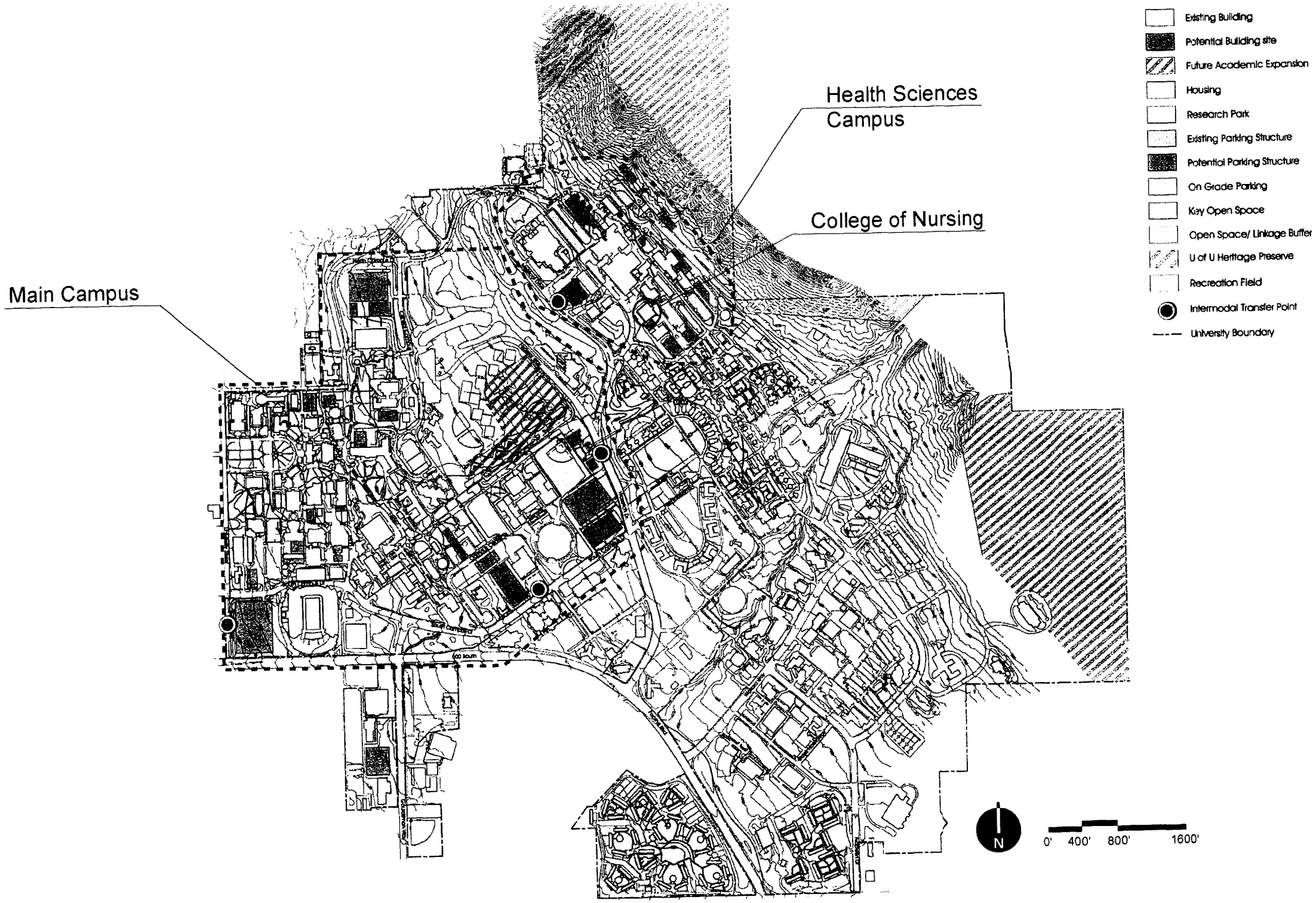

THE UNIVERSITY OF UTAH

College of Nursing Master Plan - Figure 2

Campus Long Range Development Plan

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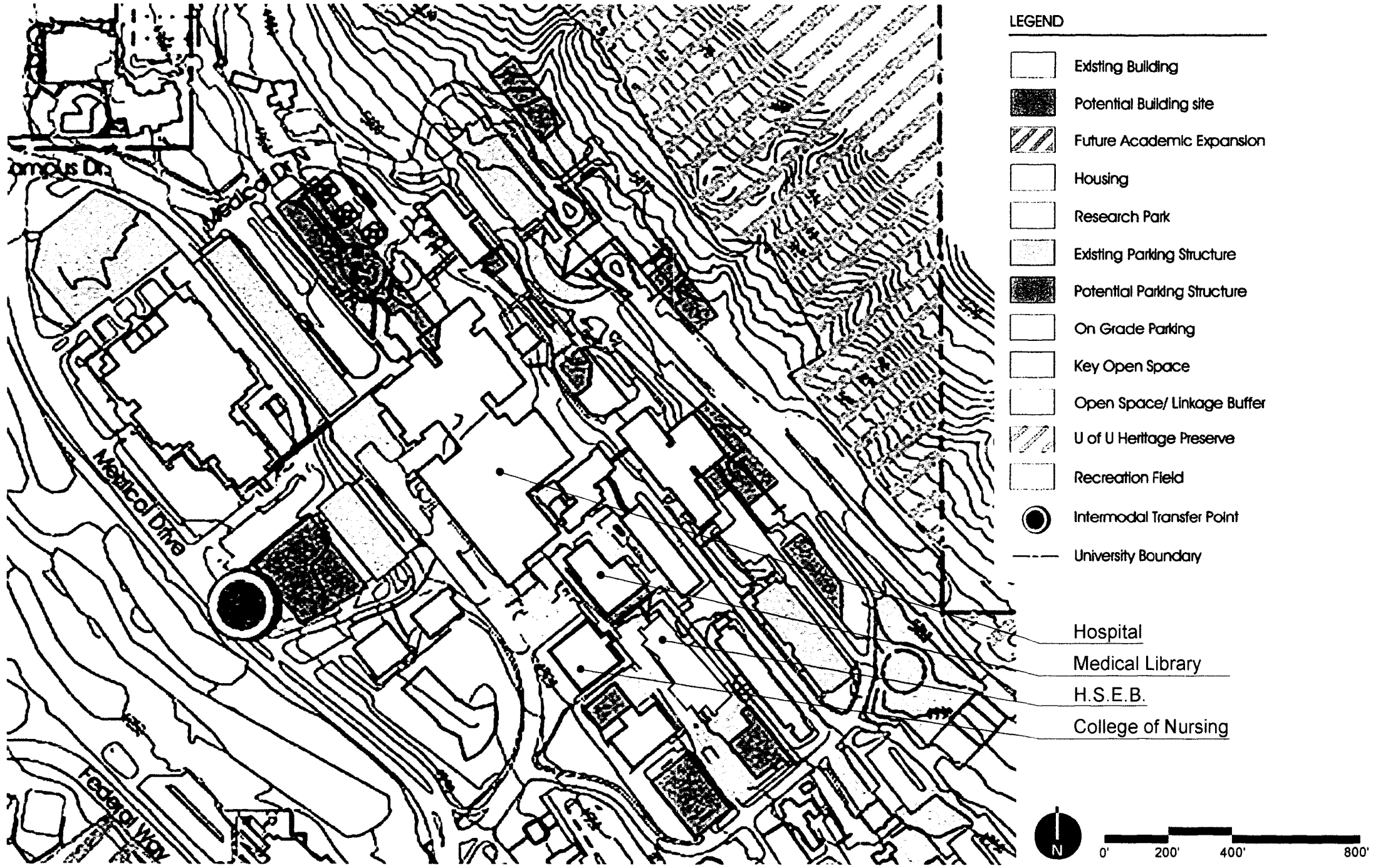

THE UNIVERSITY OF UTAH

College of Nursing Master Plan - Figure 3

Health Sciences Campus Long Range Development Plan July 2005

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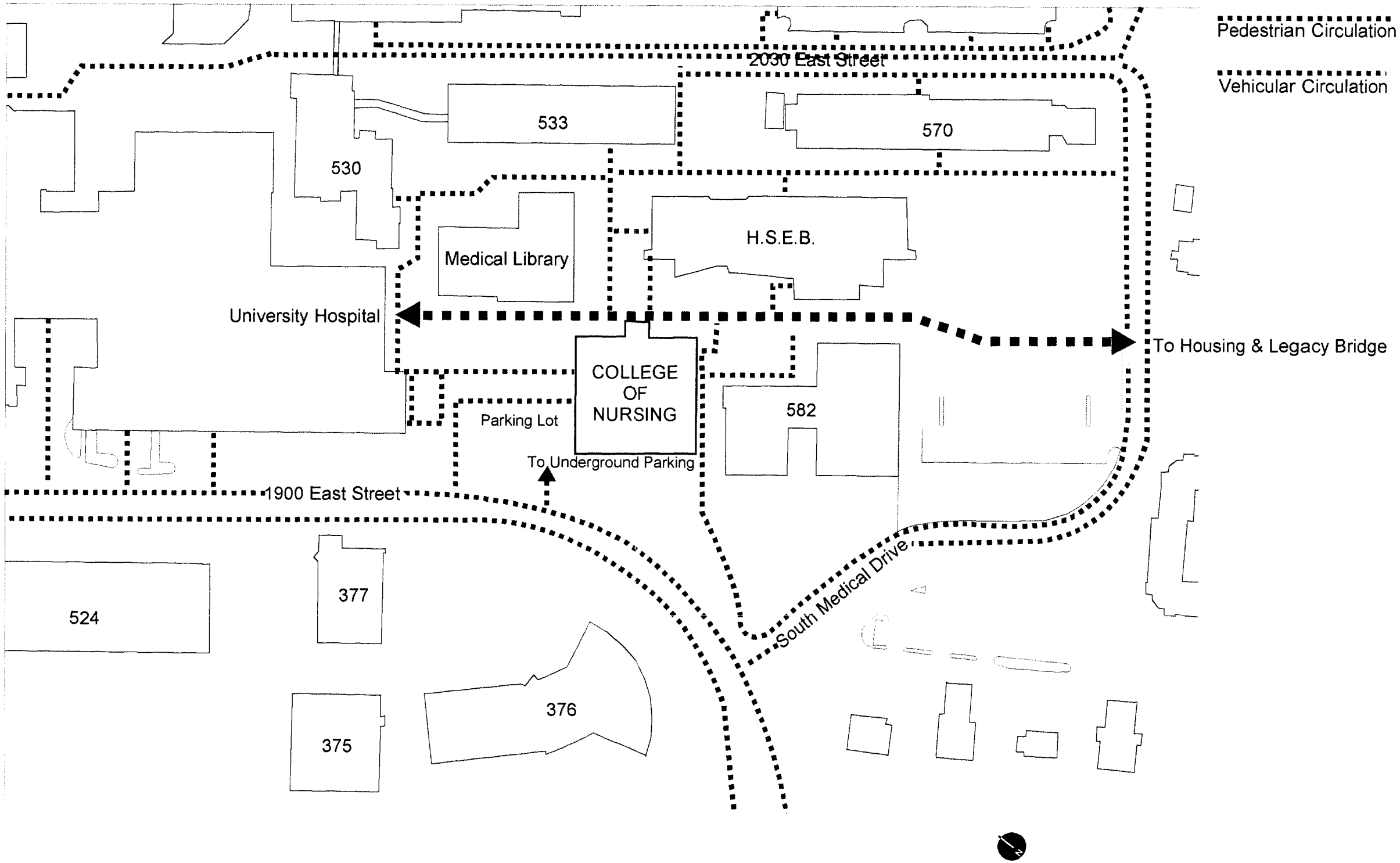

THE UNIVERSITY OF UTAH

College of Nursing Master Plan - Figure 4

Vehicular and Pedestrian Circulation Plan

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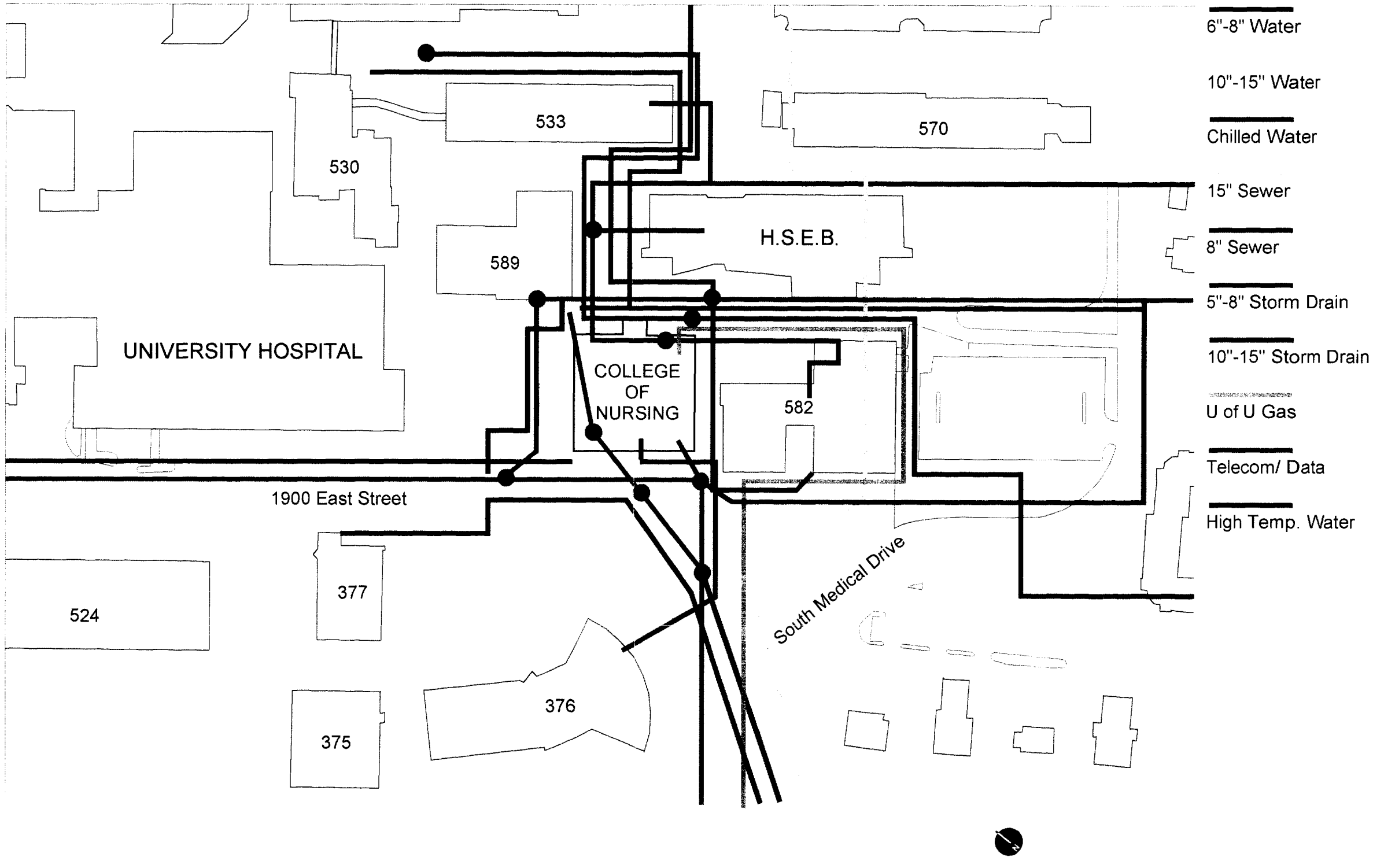

THE UNIVERSITY OF UTAH

College of Nursing Master Plan - Figure 5

Existing Site Utilities Plan

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CONSULTING
MECHANICAL
ENGINEERS

U of U College of Nursing Master Plan
Mechanical Site Utilities Impact

The proposed upgrades to the College of Nursing will add additional restrooms, and approximately 16,000 square feet of additional space.

The additional restrooms will increase the domestic water demand, and sanitary sewer demand. The approximate current demand is around 360 water supply fixture units. The existing line is 4" after the fire riser. There is an existing 8" water main to the building, and a 6" line for the fire riser. We have not addressed the fire riser. The future demand for domestic water will be approximately 530 water supply fixture units. A 4" water main will be adequate for this future demand. The approximate current sanitary sewer demand is 260 drainage fixture units. The existing main waste line in the building is 4". The approximate future demand will require a 6" waste line. According to the original building record drawings, there is an existing 6" sanitary sewer line southwest of the building. According to a site utility study, there is an existing 8" line southeast of the building. The future 6" line could be connected to either the 6" or the 8" line. The exact sizes, as well as the exact location, invert elevations, etc. of the existing lines should be determined during programming by the civil engineering firm. Some site work from the building to the tie in point will be required. The full extent of the site work required should be determined during programming.

The additional square footage will increase the building's peak heating and peak heating demand. The existing system is a constant volume system that is not operating very efficiently. The new variable volume dual duct system should improve energy efficiency by using building diversity. The total overall effect on the required cooling will be minimal. The current chilled water peak demand is approximately 225 tons at 558 gpm. The existing chilled water piping to the building is 6". The higher peak load requirements will require a chilled water peak demand of approximately 275 tons at 690 gpm. The existing 6" chilled water piping should be adequate for this flow rate. All capacities, sizes, etc. shall be verified during programming.

The current peak heating demand is approximately 6,500 MBH at 639 heating water gpm. The current high temperature water demand is approximately 70 gpm (using 390 degrees EWT and 200 degrees LWT), with a 3" existing line. The new peak heating demand will be approximately 7,500 MBH at 760 gpm heating water. This will require approximately 85 gpm of high temperature water. The existing 3" line will have the capacity to handle this increase. All capacities, sizes, etc. shall be verified during programming.

In summary, the existing 4" water main will be adequate for the future domestic water demand. The existing 6" chilled water lines, and the existing 3" high temperature lines should be adequate for the additional peak loads. The only existing line that is not currently adequate for future loads is the existing main sanitary sewer line within the building; however, the 6" sanitary sewer line adjacent to the building is adequate. This will require minimal site disturbance to perform this tie in.

The effect of this project on the central cooling and heating plants will be as follows:

1. The peak chilled water demand will increase by approximately 50 tons, although thanks to improved efficiencies, the regular chilled water usage will remain about the same.
2. The peak heating demand will increase by approximately 1,000 MBH, but again thanks to improved efficiencies, the regular use will remain about the same.

SPECTRUM
ENGINEERS

Memorandum

To:	Jill Jones	**Telephone:**	(801) 466-8818
Company:	AJC Architects	**Fax:**	(801) 466-4411
	703 East 1700 South		
	Salt Lake City, Utah 84105	**Copies to:**	
From:	Dave Wesemann	**Telephone:**	801-401-8468
Job:	College or Nursing Masterplan	**Toll Free:**	800-678-7077
Re:	Site Electrical	**Fax:**	801-401-9468
Job Number:	20040850.dew	**E-mail:**	dew@spectrum-engineers.com
Date:	June 24, 2005	**Page:**	1 of 2

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The recommendations for the electrical site work for the U of U College of Nursing Building are as follows:

SITE ELECTRICAL

Medium Voltage

The Nursing Building is served from the Campus 7,200 volt system through a duct bank to a manhole that is southwest of the building. The Campus is phasing out the 7,200 volt system and converting buildings over to the 12,470 volt system as opportunities arise. Following this direction, the Nursing Building should be converted to the 12,470 volt system as part of the Master Plan. There is 12,470V available immediately adjacent to the Nursing Building which is a duct bank system that was installed as part of the new Health Sciences Education building project. The duct bank contains a 12,470 volt feeder from the Red Butte substation and can be accessed through a manhole that is approximately 300' to the south and 50' to the east of the Nursing Building. The load of the Red Butte substation transformers and this feeder should be checked during the programming and design phases of the project to verify that the needed capacity is available for the nursing building.

Telecommunications

As-built documents indicate that the building is served with six 2" conduits from a manhole on the south-west for telecommunications and auxiliary systems. The current standard for the Campus is to use all 4" conduits and, where possible, provide service from a redundant manhole/duct bank system. The existing

2" conduit duct bank can be left in place and used to the extent possible, with a new duct bank consisting of 4" conduits to a separate manhole. One such manhole is located on the northeast side of the building, but there may be other possibilities as this is explored further with the Campus Netcom department.

Brief Description of Physical Facilities

The building housing the majority of College of Nursing operations opened in 1969. The building has served the College of Nursing well for over 35 years and has been well maintained. However, 35 years has brought with it tremendous change in ways that affect the ability of the building to meet current needs.

Issues of life safety, including seismic stability and emergency egress need to be addressed to bring the building within current acceptable parameters. The original mechanical and electrical systems have been pushed well beyond their life expectancy and building occupants are uncomfortable and inconvenienced considerably as a result.

Hazardous materials (primarily asbestos) within the building have greatly hindered improvements and upgrades over the years.

The building currently lacks a fire suppression system, however, a fire sprinkler protection upgrade has been designed as a separate project. For the purposes of the following building code analysis (refer to section 4), the master planning team was directed to assume that the fire sprinkler project will be implemented.

The building does not have adequate rest room facilities for men.

Teaching methodologies have changed tremendously since the inception of this building. Existing classrooms are not conducive to the learning environment desired. While the HSEB will fulfill much of the classroom need for the College, several classrooms will remain in the building, primarily on the second floor. As a separate project, these classrooms are being upgraded to operate in coordination with those of HSEB. Other classrooms in the building will need to be programmed and designed to provide an optimum learning environment within the existing constraints.

The existing Learning Resource Center opened along with the building, At that time, the Center was state of the art, and its layout paralleled that of the University Hospital, which had opened 4 years prior. It is now 2005, and in the intervening years the University Hospital and other key agencies have built replacement facilities. In contrast, the College's Learning Resource Center has only been slightly remodeled and enlarged in the last 35 years. It is no longer a state of the art facility and does not represent existing patterns of patient care units and nursing practice. While staff, faculty and students do their best to function in this facility, it also suffers from a severe space shortage with various activities competing for the same space. Refer to the Learning Resource and Simulation Center programming document (November 2004, ajc architects) for detailed information on the existing facilities and justification for this portion of the master plan project.

Nursing research has gained tremendous importance in the success of the College of Nursing. While much of the fifth floor of the building has been remodeled to help address the need for research space, more similar space is needed.

Faculty growth is also anticipated, and the college is now limited in the recruitment and hiring of new faculty due to lack of office space.

Functionally the building does not have a natural "flow" to the first floor. Occupants also report that the functional components of and throughout the building are not organized or zoned efficiently

as changes for convenience have occurred over 35 years. Lack of positive adjacencies and relationships between spaces cause conflicts and inefficiencies that are detrimental to building operations and security.

Aesthetically, the exterior of the building remains an attractive member of the Health Sciences Campus and is a good expression of the design ethic of its era. The consensus of the steering committee is that the design of exterior additions to the building that are necessary to provide more space, enhance seismic stability, and improve circulation and emergency egress, may be expressive of this day and age, reflect the technological emphasis of the school, and provide a visual link to the HSEB.

The interior of the building, with the exception of recently remolded or refinished areas, appears outdated and in many places worn and tired. The direction is to relate new building interior finishes to the 5th floor Emma Eccles Jones Research Center.

There was also expressed a strong desire for increased natural light into the building.

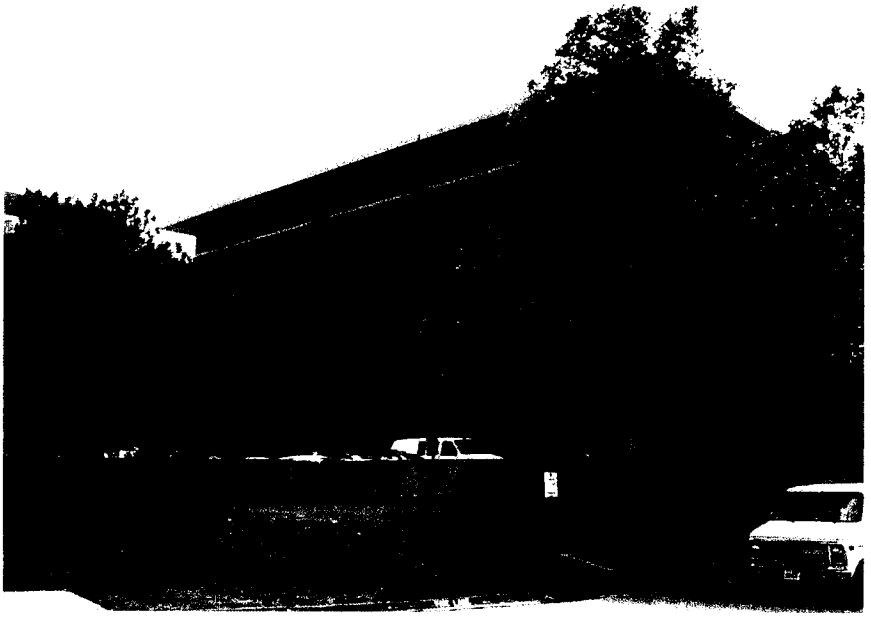
There currently exists a problem in the building with insect infiltration. As areas of the building are gutted and the building envelope is uncovered, it is imperative that any gaps, holes, or cracks be carefully sealed in order to address this issue.

For a summary of existing building area numbers, color coded by existing use/funtion category, see

FIGURE 6: CURRENT NET AND GROSS AREA TABLE.

Existing building floor plan graphics, color coded by existing use/function category, are provided as follows:

FIGURE 7: EXISTING LOWER LEVEL PARKING PLAN
FIGURE 8: EXISTING LEVEL ONE PLAN
FIGURE 9: EXISTING LEVEL TWO PLAN
FIGURE 10: EXISTING LEVEL THREE PLAN
FIGURE 11: EXISTING LEVEL FOUR PLAN
FIGURE 12: EXISTING LEVEL FIVE PLAN
FIGURE 13: EXISTING MECHANICAL PENTHOUSE PLAN

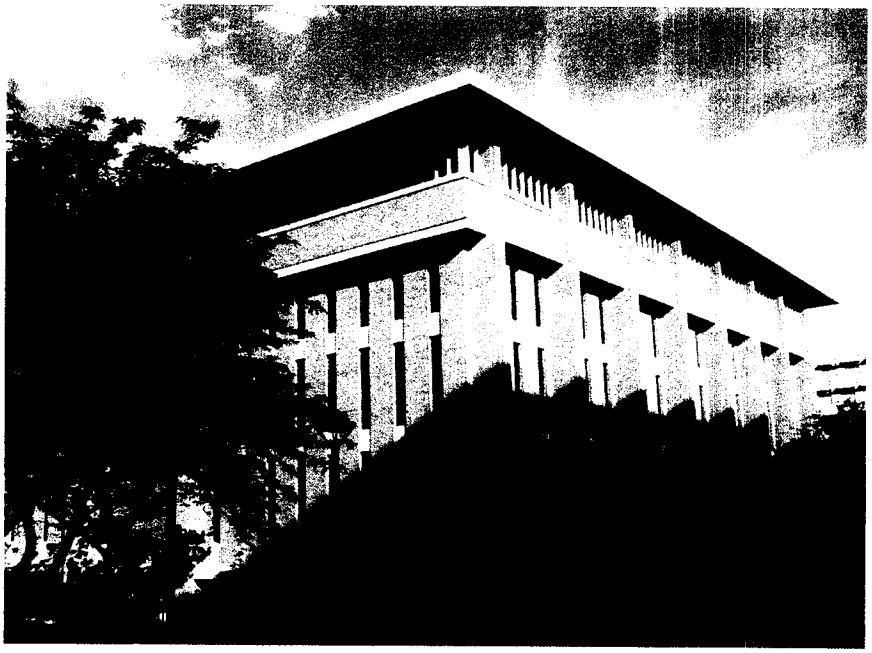


THE UNIVERSITY OF UTAH

College of Nursing Master Plan

Building photograph June 2005

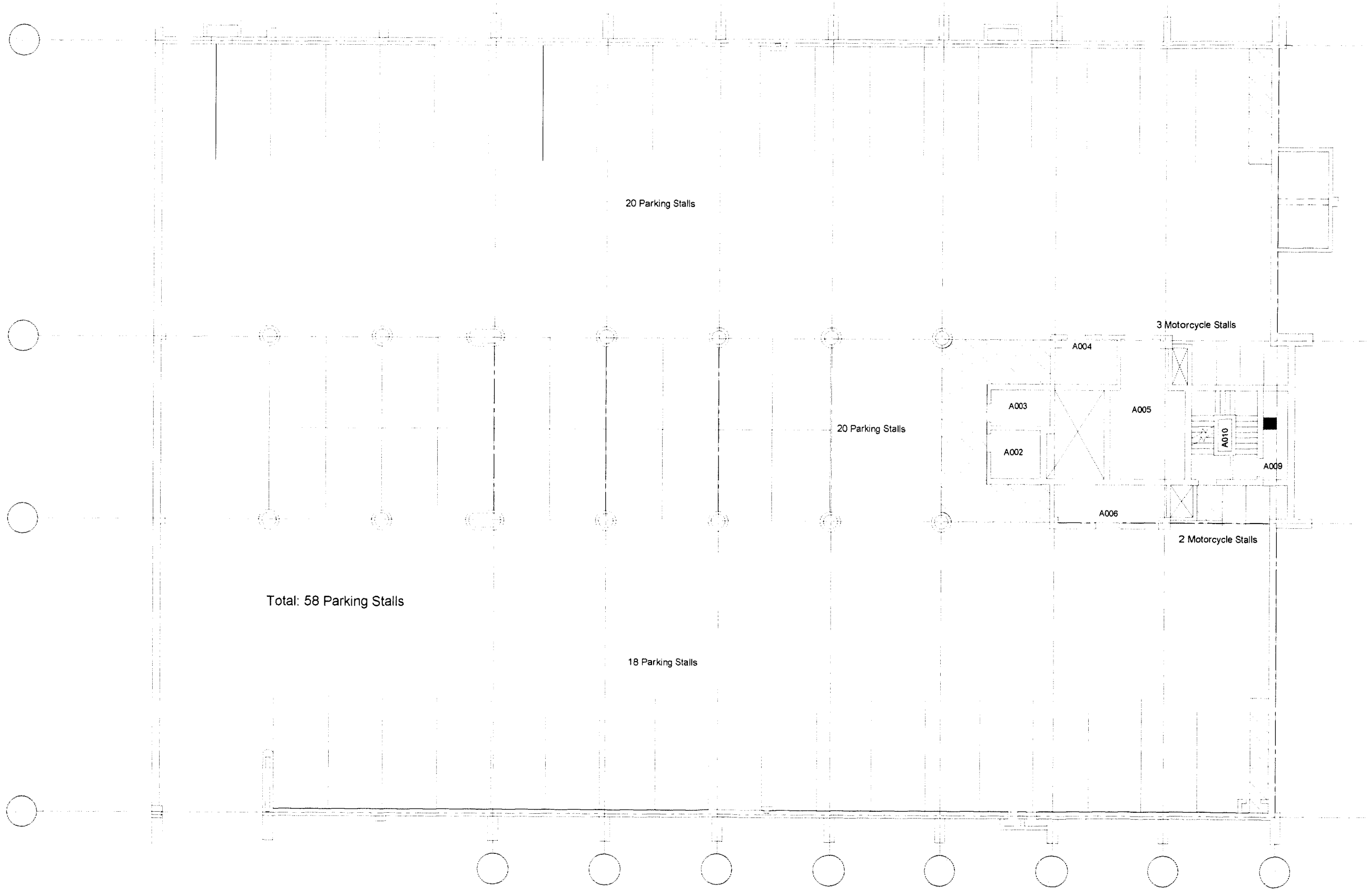
ajc architects



Current Net & Gross Area Table

	Central Administration	Clinical Practice	Research	Teaching/ Education/ L			Total Net	Circulation Mech./ Cust. Restrooms	Walls Others	Gross
				Classrooms Labs	Offices Support					
First Level	1,061	1,180	0	0	606	0	2847	2,469	1,944	7,260
Second Level	214	0	0	8,456	0	1,598	10,268	5,032	1,854	17,154
Third Level	0	0	0	6,462	4,015	0	10.477	4,401	2,276	17,154
Fourth Level	5,949	0	0	1,187	2,981	0	10,117	4,920	2,117	17,154
Fifth Level	531	0	6,630	2,179	908	1,140	11,388	5,421	1,931	18,740
Subtotal	7,755	1,180	6,630	18,284	8,510	2,738	45,097	22,243	10,122	
Total										77,462

NOTE: Lower Level Parking, Mechanical Room & Penthouse are not included.



THE UNIVERSITY OF UTAH

College of Nursing Master Plan - Figure 7

Existing Lower Level Parking

July 2005

0' 4' 8' 16'

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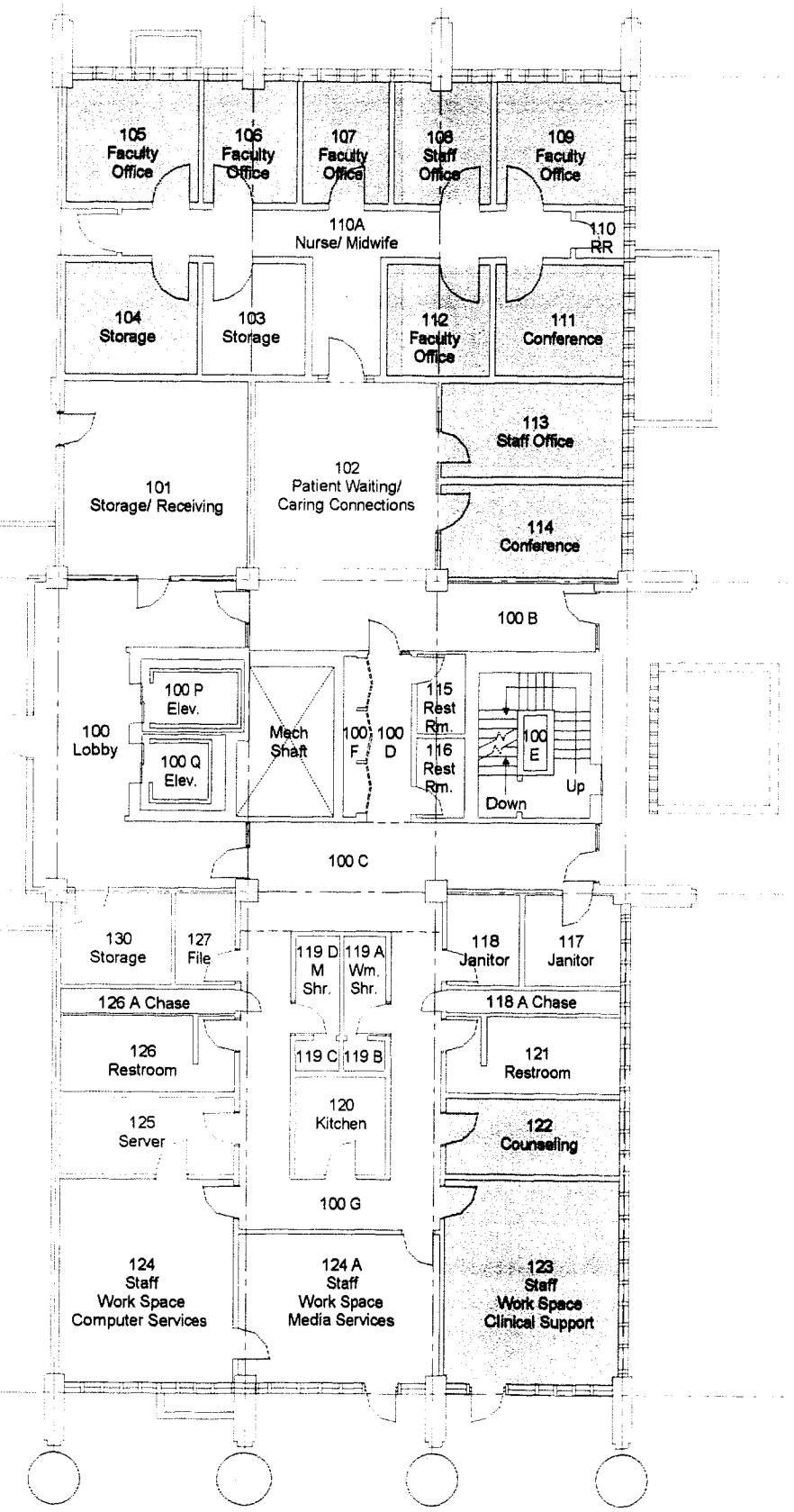
Total: 28 Parking Stalls

8 Parking Stalls

12 Parking Stalls (2 HC)

8 Parking Stalls

1,061 S.F.	Central Administration
1,180 S.F.	Clinical Practice
N/A	Research
606 S.F.	Teaching/ Education/ Learning
	Classrooms/ Labs
	Offices/ Support 606 S.F.
	Student Spaces
2,469 S.F.	Circulation/ Mech./ Cust./ Restrooms
1,944 S.F.	Walls/ Others
7,260 S.F.	Total Gross



THE UNIVERSITY OF UTAH

College of Nursing Master Plan - Figure 8

Existing Level One Plan

July 2005

0' 4' 8' 16'

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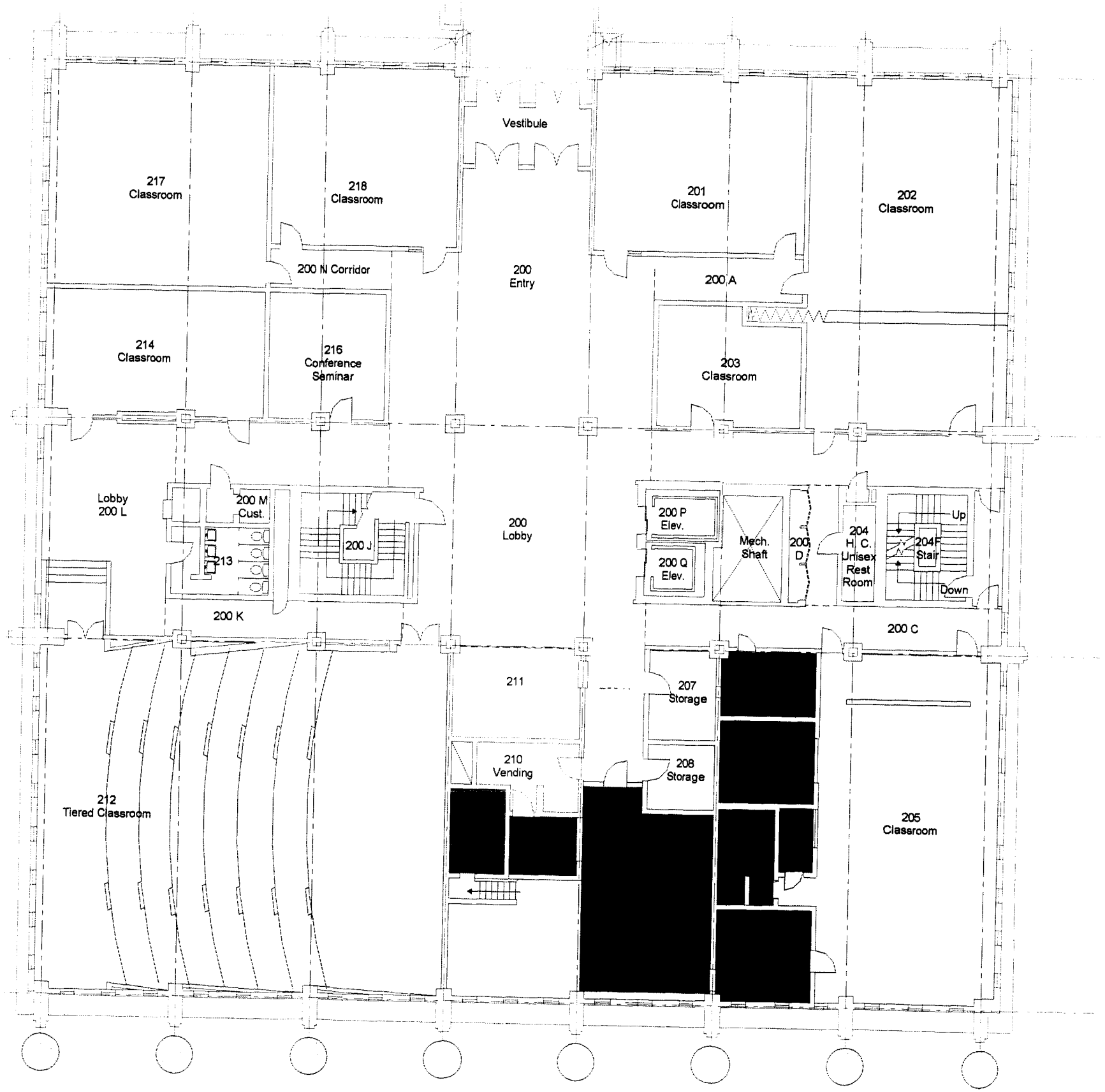

214 S.F.	Central Administration
N/A	Clinical Practice
N/A	Research
10,054 S.F.	Teaching/ Education/ Learning
Classrooms/ Labs 8,456 S.F.	Offices/ Support — Student Spaces 1,598 S.F.
5,032 S.F.	Circulation/ Mech./ Cust./ Restrooms
1,854 S.F.	Walls/ Others
17,154 S.F.	Total Gross

THE UNIVERSITY OF UTAH

College of Nursing Master Plan - Figure 9

Existing Level Two Plan

July 2005

0' 4' 8' 16'

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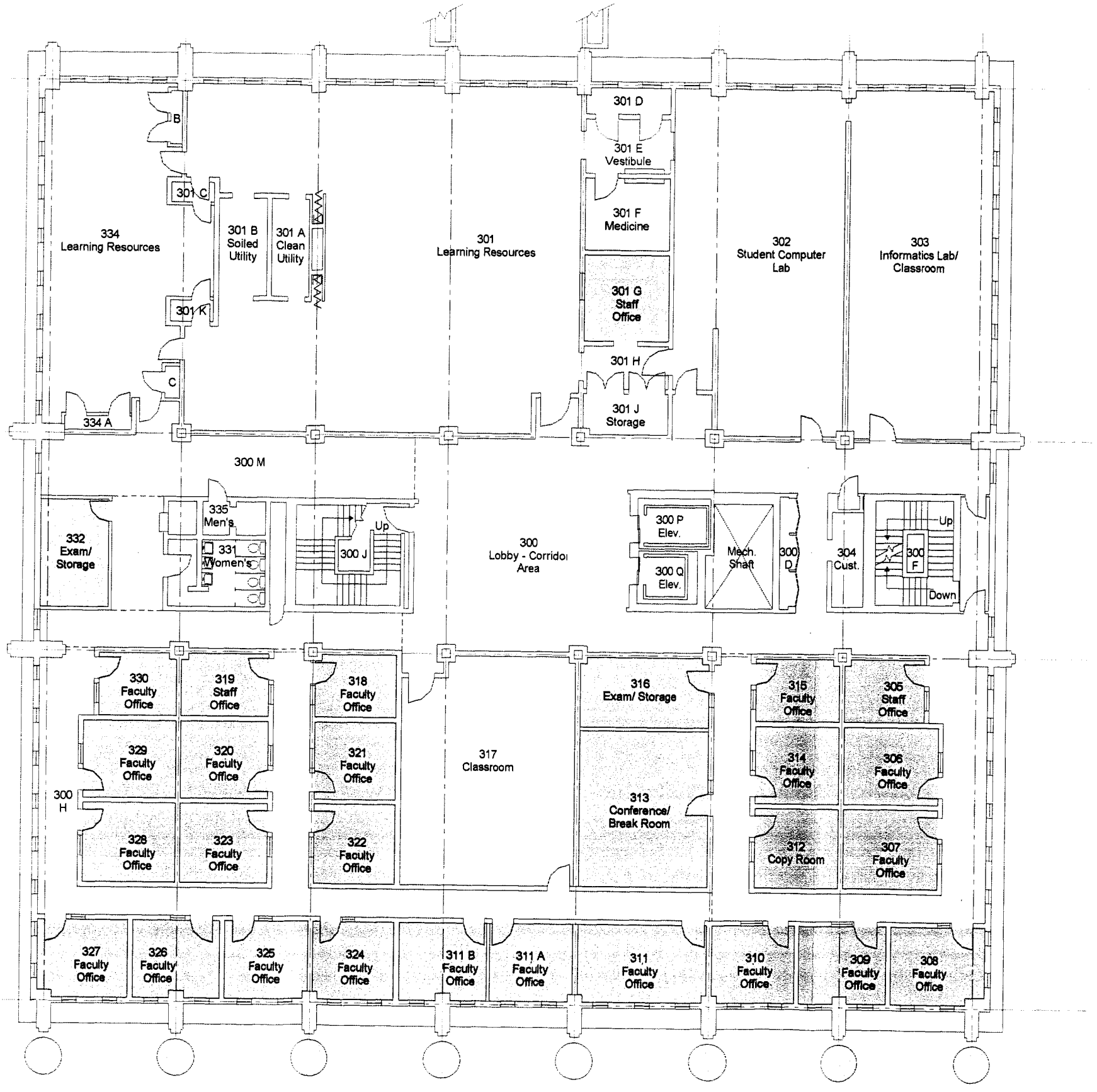

N/A	Central Administration
N/A	Clinical Practice
N/A	Research
10,477 S	Teaching/ Education/ Learning
Classrooms/ Labs 6,462 S.F.	Offices/ Support 4,015 S.F. — Student Spaces
4,401 S.F.	Circulation/ Mech./ Cust./ Restrooms
2,276 S.F.	Walls/ Others
17,154 S.F.	Total Gross

THE UNIVERSITY OF UTAH

College of Nursing Master Plan - Figure 10

Existing Level Three Plan

July 2005

0' 4' 8' 16'

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5,949 S.F.	Central Administration
N/A	Clinical Practice
	Research
4,168 S.F.	Teaching/ Education/ Learning
	Classrooms/ Labs 1,187 S.F.
	Offices/ Support 2,981 S.F.
	Student Spaces
4,920 S.F.	Circulation/ Mech./ Cust./ Restrooms
2,117 S.F.	Walls/ Others
17,154 S.F.	Total Gross

THE UNIVERSITY OF UTAH

College of Nursing Master Plan - Figure 11

Existing Level Four Plan

July 2005

0 4' 8' 16'

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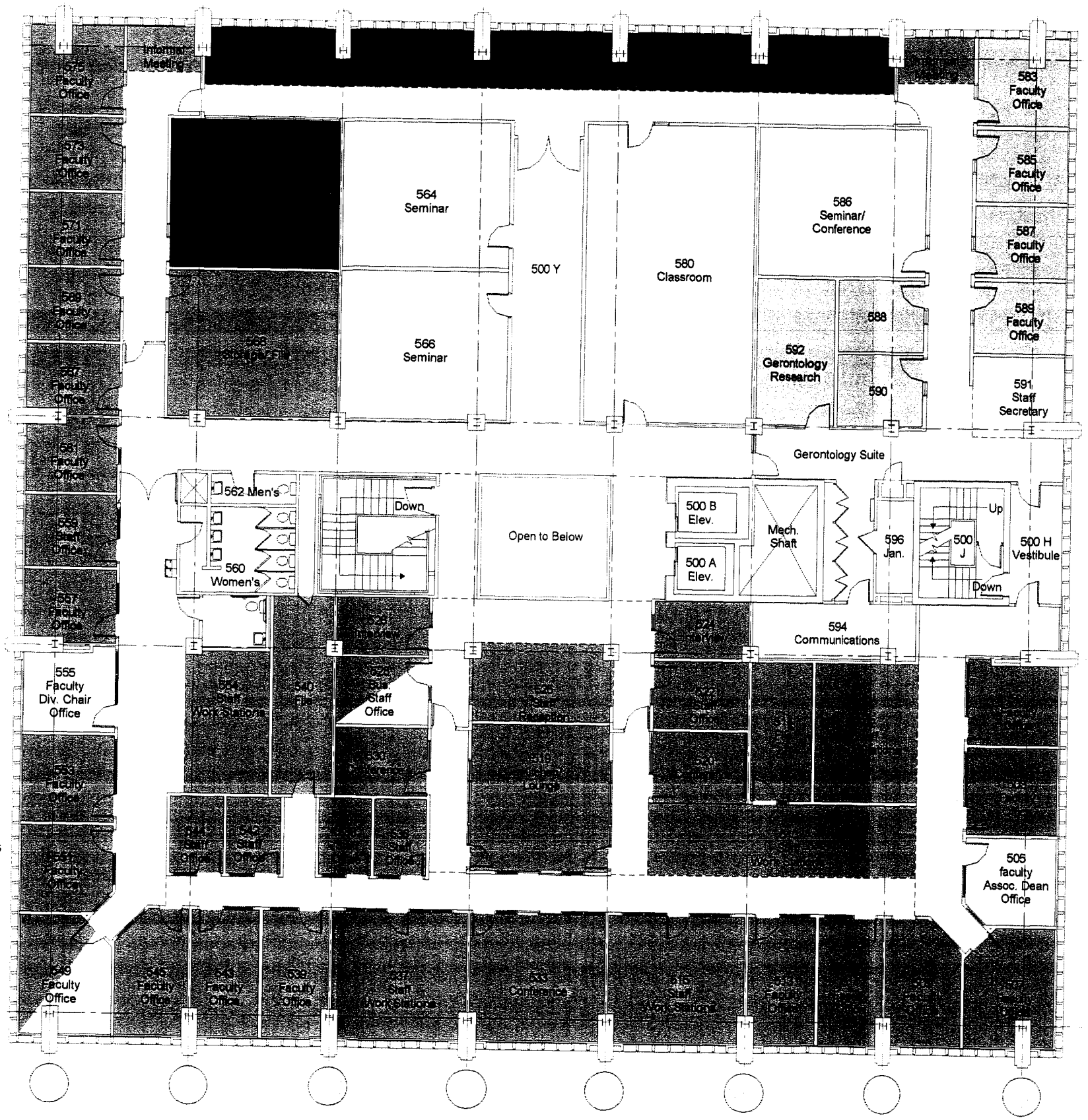

531 S.F.	Central Administration
N/A	Clinical Practice
6,630 S.F.	Research
4,227 S.F.	Teaching/ Education/ Learning
Classrooms/ Labs 2,179 S.F.	Offices/ Support 908 S.F. — Student Spaces 1,140 S.F.
5,421 S.F.	Circulation/ Mech./ Cust./ Restrooms
1,931 S.F.	Walls/ Others
18,740 S.F.	Total Gross

THE UNIVERSITY OF UTAH

College of Nursing Master Plan - Figure 12

Existing Level Five Plan

July 2005

0' 4' 8' 16'

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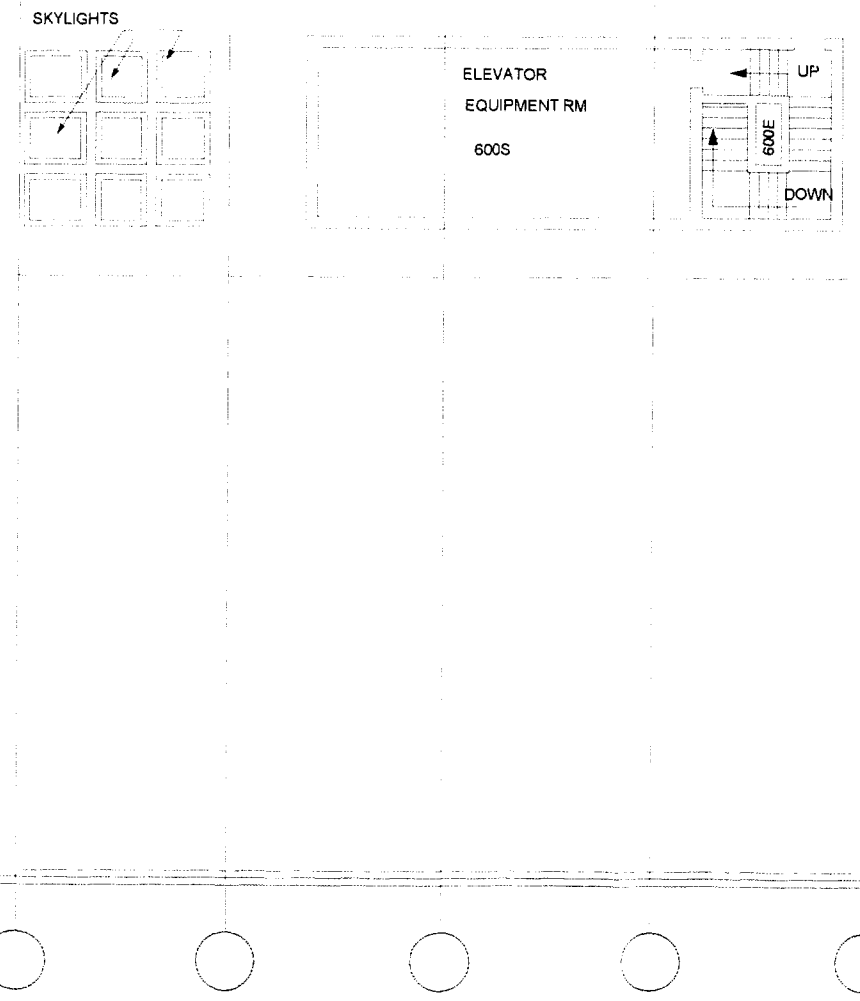

THE UNIVERSITY OF UTAH

College of Nursing Master Plan - Figure 13

Existing Mechanical Penthouse Plan

July 2005

0' 4' 8' 16'

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Architectural Review

Building Code Review-International Building Code (IBC 2003)

Code and Assumptions

The scope of this study included a concept-level review of existing conditions at the College of Nursing in relation to the current building code to assist in the creation of the master plan. The International Building Code 2003 edition was the standard used for the code compliance. As the master plan is implemented over time, compliance with other code standards will need to be determined in the programming and design phases of the project(s). Proposed designs will need to be reviewed by Campus Design and Construction and the Fire Marshall having jurisdiction.

Overview of Existing Conditions

The existing building structure is masonry, concrete, and steel, Type III-B construction (assumed). These materials comply with code for this type of construction. The partition walls of the interior appear to be gypsum board with metal studs. The shaft walls appear to be concrete.

Doors at stair enclosures appear to be rated, however they do not have smoke seals. Rated corridors are not required per Table 1016.1 (with sprinkler system). Where fire barrier walls may be required to separate uses, the door/frame assemblies are not rated.

Occupancy Classifications & Required Separations

The existing building has the following occupancy classifications:

A-3

Classrooms and lecture halls for 50 or more occupants

Lecture Hall 212	2nd Floor	134 occupant load
Classroom 202	2nd Floor	66 occupant load
Classroom 205	2nd Floor	59 occupant load
Learning Resources 301	3rd Floor	128 occupant load

B

Labs, classrooms, and offices

S-2

Parking garage

Required separations (including 1 hour fire reduction due to fire sprinkling):

A-3 to B - 1 hour fire barrier
A-3 to S-2 - 1 hour fire barrier
B to S-2 - 1 hour fire barrier

Type III-B Construction

	Allowable Square Footage	Current Square Footage
A-3 Occupancy	106,875 sf	7,461 sf
B Occupancy	213,750 sf	70,001 sf
S-2 Occupancy	195,000 sf	33,980 sf

The building appears to be deficient in wall construction where fire barriers are required by the IBC for separations between the Assembly use and the rest of the building. Doors could be replaced with rated doors and frames, however the overall construction of walls is questionable. In some places above ceiling, walls appear to have transfer grilles or openings, using the ceiling space as a return air plenum. In order to rate walls, additional ductwork and fire dampers will be required.

Allowable Areas

The building appears to have adequate frontage on public ways, therefore, the allowable areas have been calculated with the assumption of the maximum increase. The actual areas (approximate) are within the code limits. The "basement" level, which may be excluded from the allowable square footage, has been included in the actual areas. Allowable areas also include the fire sprinkler increase per section 506.3.

Allowable Height

The building is within the allowable heights of Table 503 for Type III-B construction.

Fire Walls

Fire walls are not required.

Exiting

The travel distance in corridors appears to be within the limits required in Table 1015.1. The building has two exits, one through the second level lobby, the second through the stair to first level (basement).

Occupant loads are low enough that the minimum stairway and corridor widths (44 inches) apply. Actual widths exceed the minimum requirements.

Dead ends: The installation of automatic sprinklers allows dead ends up to 50 feet in B occupancies. The building does not appear to have any dead end corridors.

Stairways are required to be enclosed in 1 hour construction. Door and frames at stair enclosures appear to be rated. Frames are missing smoke gaskets.

Plumbing Fixtures

The building does not have adequate rest room facilities for men.

Required Toilets:	14 men	14 women	
Actual Toilets:	5 men	18 women	3 unisex

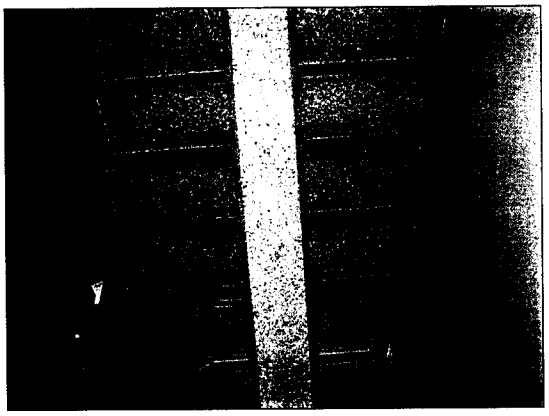
The majority of drinking fountains in the building are not accessible.

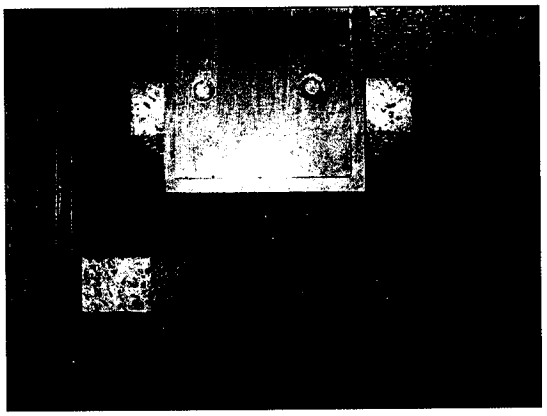
Note

For a more detailed code review refer to the building narrative code analysis that was developed for the College of Nursing Fire Alarm and Suppression System Upgrade Project by Van Boerum & Frank Associates available through University of Utah Campus Design and Construction. The applicable code at that time was the 2000 IBC.

The following conditions were found to be in violation of the IBC 2003:

North Exit Stair

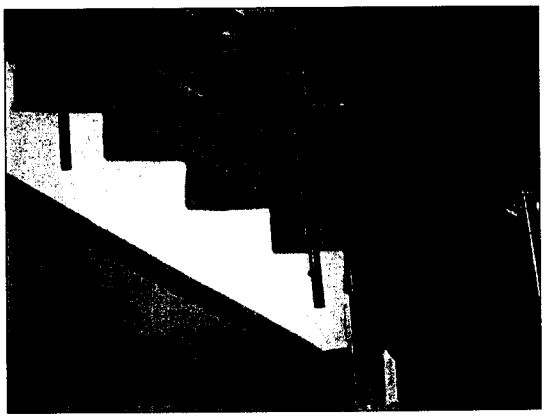




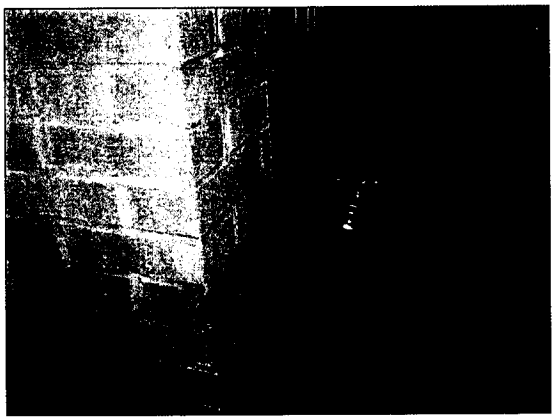
- Existing stairs do not have solid risers, and have a gap of over 5" between the treads. Code requires a maximum of 4" of opening for open risers.
- Existing landings have gaps of over 7" to the wall. Code does not allow such gaps between landing and the walls.
- Existing handrails are not continuous. Code requires a minimum of one handrail (typically the inside handrail) to be continuos.

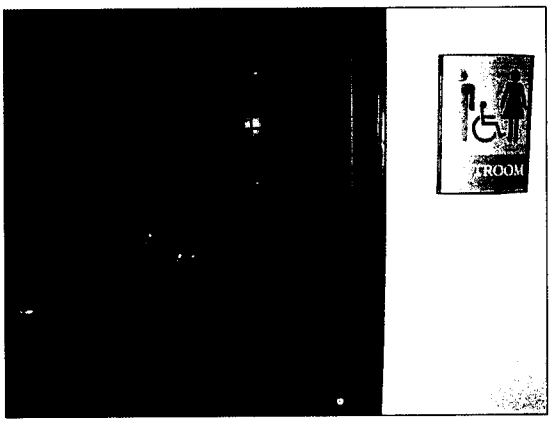
South Exit Stair

- Existing tread width: some at 43½" and some are 48½'". The minimum required by code is 44".
- Existing landing depth: 43½". The minimum required by code is 48½" (based on the width of the widest stair tread).
- Existing spacing of handrail members: 6". The maximum spacing of handrail members required by code is 4".
- Existing handrails are not continuous. A minimum of one continuous handrail (typically the inside handrail) is required by code.



In addition to the violations of the IBC 2003, the following violations of the ADA were observed:





- Almost all door handles (with the exception of the majority of level 5 and other recently remodeled areas) do not comply with ADA standards.
- Closers on all doors (except level 5 entrance vestibule) do not comply with ADA standards.
- Several doors do not comply with the 12" push and the 18" pull minimum standard of the ADA.
- None of the rest rooms are ADA accessible with the exception of one unisex rest room on level 2 and on level 5.

Recommendations

- Add smoke gaskets to stair enclosure doors.
- Modify stair risers and treads at north stair enclosure, so the gap between the risers and treads are 4 inches or less. IBC allows gaps of only up to 4 inches.
- Modify rails at both stairs, so the gap between rails are 4 inches or less and handrails are continuous.
- At rooms classified as A-3 Occupancies (or that may be classified as such depending on use) provide smoke gasketing and closures on existing doors.
- Additional work including, but not limited to replacing doors and frames with rated units, replacing walls with rated walls, and adding smoke and fire dampers to ductwork.
- Provide accessible rest room facilities.
- Increase mens' rest room facilities in building.

STRUCTURAL
EXISTING CONDITIONS AND BUILDING REVIEW

INTRODUCTION

In recent years the awareness of the potential of earthquakes in Northern Utah has been heightened. Recent discoveries along with geotechnical and geoseismic investigations have revealed that major earthquakes occur in Northern Utah on a regular geologic basis. Since many of the buildings found in Northern Utah were built at a time when knowledge of the region's seismicity and the knowledge of proper seismic detailing were limited, these buildings are particularly vulnerable in terms of potential damage due to seismic motion. The building at the College of Nursing in University of Utah is no exception. Also, in recent decades, innovative changes have been incorporated into building codes to deal with seismic issues. Buildings designed prior to these innovations simply do not have the inherent characteristics that enable them to perform as well during a significant earthquake. Many older buildings are vulnerable to seismic damage simply because they were designed and built without the benefit of modern standards and code criteria.

OBJECTIVES AND SCOPE

The evaluation of the College of Nursing building will be completed using a tiered approach specified in ASCE/SEI 31-03. The first tier, or screen phase, includes a review of construction documents, site observations, and the completion of a number of checklists and associated quick check calculations. The second tier of the evaluation is performed for structures that do not comply with the requirements of the tier 1 screening. Tier 2 evaluation includes a detailed analytical evaluation of the various structural members. Structures that fail to comply with the requirement of a tier 2 evaluation can be evaluated in yet a third tier of evaluation. The tier 3 evaluation employs very sophisticated and time intensive nonlinear analysis. The use of these nonlinear techniques can in some cases qualify structures that would not meet the requirements of a linear tier 2 analysis. The evaluation methodology is discussed more fully in the following section.

The objective of this report was to complete a seismic screening of the college of nursing building per the methodology outline in ASCE/SEI 31-03. Based on these findings in tier1, a tier 2 evaluation has been performed. The tier 2 evaluation required the completion of the following tasks:

- Site investigation to confirm the layout of structural elements that are part of the building's lateral force resisting system and to assess the physical condition of the building.
- In-depth study of existing building drawings to develop an accurate understanding of the construction of the building.

- Create a three-dimensional computer model(s) that will be used to accurately calculate distributed lateral forces on structural elements under design lateral loads.
- Perform calculations on structural elements to determine demand to capacity ratios to verify the adequacy of existing construction.
- Develop a schematic seismic upgrade plan to show the extent of seismic rehabilitation work required to strengthen the building.
- Develop an estimate of probable cost for structural seismic rehabilitation work.

BASIS OF EVALUATION

The seismic evaluation of the College of Nursing Building was performed per ASCE/SEI 31-03, "*Seismic Evaluation of Existing Buildings,*" 2003. This standard is the nationally recognized standard for the seismic evaluation of existing buildings.

ASCE/SEI 31-03 was developed specifically for evaluating the capacity of existing buildings to withstand earthquake force levels established by the most recent criteria set by earthquake scientists. Applying the requirements of new building codes, such as IBC 2003, to existing buildings is generally not recommended because detailing requirements for ductile lateral force resisting systems in new construction cannot be incorporated in older buildings. ASCE/SEI 31-03 provides *m*-factors that are component demand modifiers that are based on the Performance Objective and the component or element. These *m*-factors establish the design capacity of the members.

The performance objective for this study has been established as Life Safety Performance Level at the Maximum Considered Earthquake (MCE). The MCE represents the characteristic large earthquake determined for the region.

Life Safety Performance is defined as the structural components ability to maintain a margin of safety against failure and/or collapse, and the overall risk of life-threatening injury as a result of structural damage. This risk is expected to be low.

Seismic force levels used in ASCE/SEI 31-03 analyses are developed using mapped ground accelerations multiplied by modification factors to obtain a seismic coefficient. Seismic forces for this site were generated based on contour maps prepared by the USGS. Due to the proximity of the site to known faults the anticipated accelerations are high. The peak expected acceleration for buildings with short periods for the MCE is 1.77 g (1.77 times the weight of the structure).

The acceleration determined from these maps is modified by multiplying it by a series of coefficients outlined in ASCE/SEI 31-03. This seismic coefficient is multiplied by the participating weight of the building to calculate an equivalent static lateral load. Utilizing a mathematical model of the building, the equivalent static lateral load is distributed to structural elements that resist lateral forces to determine the demand on each element.

Structural elements are classified as either primary or secondary, primary elements being those structural elements and components that provide the capacity of the structure to resist collapse under seismic forces induced by ground motion in any direction. These elements create the Seismic Force Resisting System (SFRS). All other elements are classified as secondary.

Expected strengths for building materials used in the construction of the building are determined through existing drawings and specifications. These expected strengths are multiplied by an *m*-factor to establish the design capacity of the structural element. The *m*-factors are demand modifiers that account for expected ductility associated with a specific action at the selected structural performance level. Demand to Capacity Ratios (DCR) are calculated for each element and compared to the acceptance criteria for the analysis method. If deficiencies remain, rehabilitation methods will need to be investigated.

SITE SEISMICITY

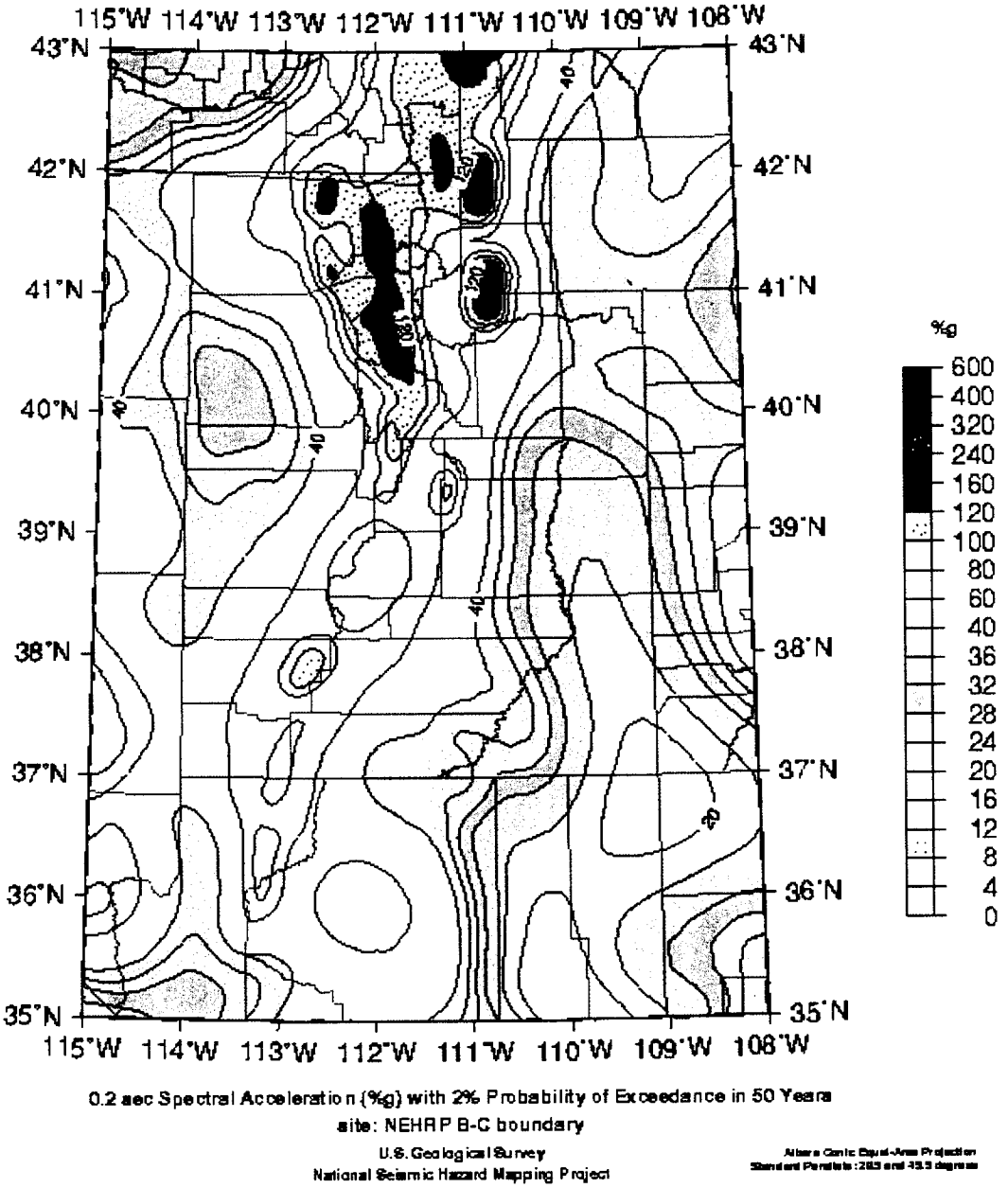
The College of Nursing Building is located within the Wasatch fault zone. Geologic seismic hazard mapping indicates that this site could experience severe lateral ground shaking.

Due to its proximity to the Wasatch Fault, the expected ground accelerations are high. The expected ground motion for the College of Nursing Building and other sites near the fault are expected to be of similar magnitude of ground motions of many areas at or near fault-lines along the coast of California.

ASCE/SEI 31-03 defines a minimum level of lateral forces to use for the evaluation of structures based on ground motions corresponding to the MCE. It is based upon analysis of available geoseismic data and is meant to represent the large, rare seismic event that is characteristic for the site. USGS (United States Geological Survey), in cooperation with NEHRP (National Earthquake Hazards Reduction Program) have developed contour maps that display the level of lateral motion expected for any site across the United States. The information shown in the contour maps is then mathematically combined with coefficients representing localized soil conditions to produce the expected level of ground motion.

To enable engineers to determine the most appropriate level of force for the building in question, the contour maps are divided to represent two primarily unique building classifications. These are termed as buildings with short periods (periods in the range of 0.2 seconds) and buildings with long periods (periods in the range of 1.0 seconds or more). A building period is defined as the amount of time required for the structure to complete one complete cycle of natural vibration. For the buildings at the College of Nursing, the contour maps indicate that horizontal accelerations could be in excess of 1.77 g for short period structures (see Figure 2). For more limber long period structures horizontal accelerations could be in excess of 0.79 g. This means that a very stiff short

structure could experience horizontal forces as high as 1.77 times its own weight and a taller, more limber structure could experience horizontal forces as high as 0.79 times its own weight for the characteristic earthquake.



USGS Spectral Acceleration Map (MCE)

Figure 1

R E
& A

BUILDING DESCRIPTION-STRUCTURAL

The College of the Nursing Building was constructed in 1967. This building consists of a 4 story office and classroom building above the 2 levels of the parking structures. The upper level of the parking structure is at ground level. The parking structure has been repaired in 1988.

The office and classroom building is a steel framed structures supported on the concrete columns and walls at parking level. The columns consist of the wide flange sections that are spliced at the second and fourth floors. The suspended floor slab consists of 3" light weight concrete over the 1 ½" deep composite metal deck reinforced with #3 at 12" o.c. each way. The metal deck at floors bears on wide flange beams with composite construction.

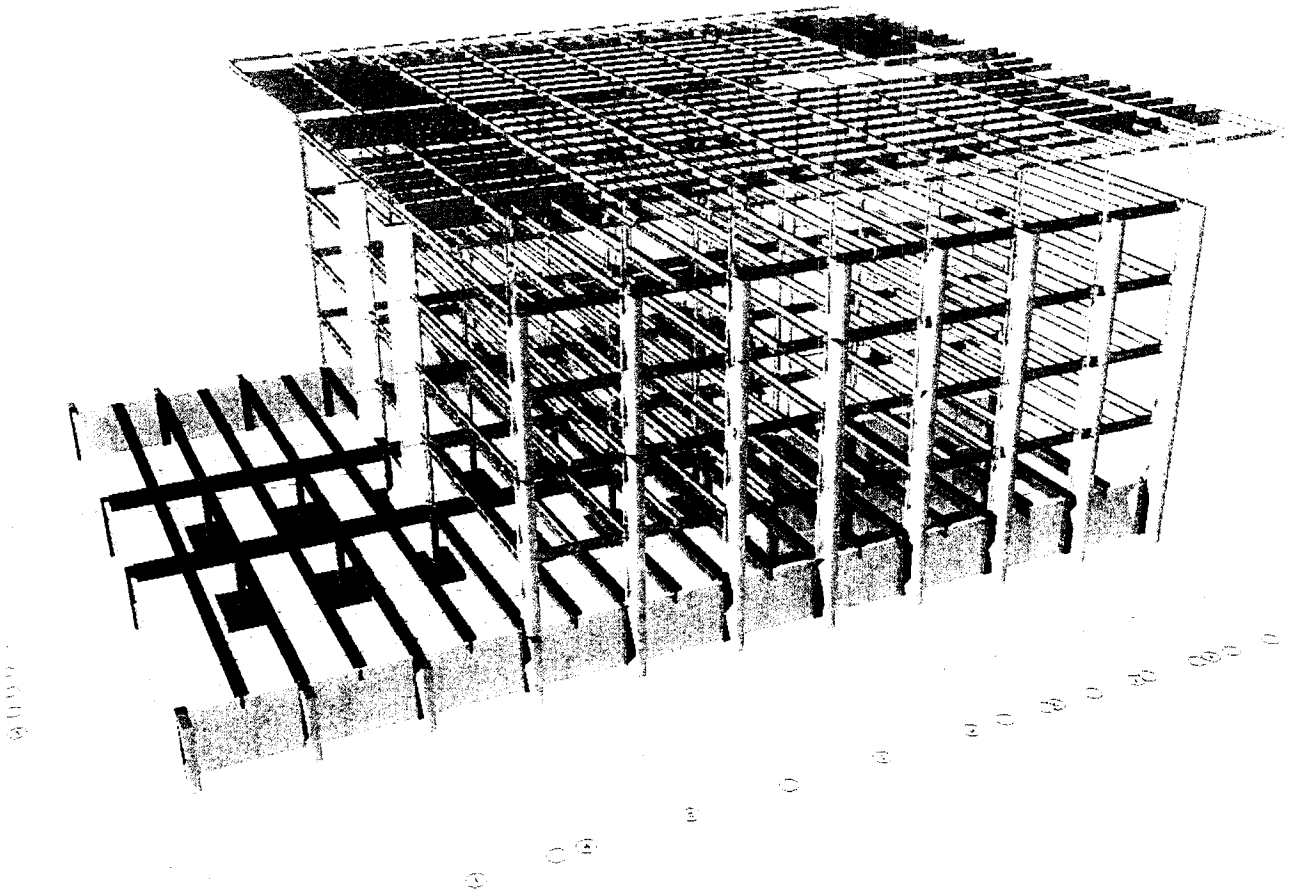
The roof structure is comprised of 2 ½" light weight concrete on 1 ½" deep, 22 Ga. Metal deck. The roof slab bear on the wide flange beams.

The parking floor consists of the 4 ½" reinforced concrete slab supported by post tensioned concrete beams. The post tensioned beams are supported by concrete columns and walls.

The seismic force resisting system consists of reinforced masonry shear piers at exterior and steel moment frames in orthogonal direction. Reinforced concrete shaft walls at stair and elevator will function as shear walls. Steel moment frames consists of steel wide flange columns and beams with bolted end plate connections. Concrete over metal deck at the floors and roof functions as a rigid horizontal diaphragm.

3D View of the Building

The existing building frame in 3D view is shown in Figure 2.



Building in 3D View

Figure 2

FINDINGS

For the tier 1 analysis, ASCE/SEI 31-03 requires investigation into the primary seismic systems of the structure as well as investigation into building characteristics that are commonly considered to be critical in terms of a building's seismic safety and ability to perform in a significant earthquake. The criteria used to evaluate the building was based on the Basic Safety Objective which requires that the building perform a Life Safety level of performance at the Maximum Considered Earthquake (MCE).

In order to conduct this investigation, ASCE/SEI 31-03 provides a structural checklist to evaluate building characteristics that have primary influence over a structure's ability to safely withstand the forces of a moderate or major earthquake. The findings of these checklists help to identify areas or components of the building that have potential seismic deficiencies. The areas or components identified in the checklist are then evaluated in a tier 2 evaluation to determine the extent of the deficiencies.

In the evaluation of the College of Nursing Building, checklists were conducted on each portions of the structure. Each item in the checklist was reviewed for compliance, or non-compliance based upon plan review, a limited site walk through, limited analysis, and engineering judgments. The full results of the checklists are included in the appendix.

A Tier 2 analysis of the Nursing building structures required computer models of the structures to be developed to analyze the forces in the elements. Computer models of each structure were created and analyzed individually. Each building section required a significant amount of computer analysis to determine the seismic behavior of the buildings. All computer modeling was done using RAM version 8.2.4. In the computer models, all beams and columns were modeled in the program using the parameters given in the original design drawings. Earthquake loads were applied to the computer model based on the specific ground motion expected at the location of the terminal building based upon the MCE.

As the earthquake forces were applied to each of the computer models, specific information regarding movement of the structure, forces in the beams and columns, and stresses in the connections was gathered. This information was then input into spreadsheets developed to evaluate critical elements for life safety and collapse prevention using the ASCE/SEI 31-03 Guidelines.

The computer model the building is shown in Figure 3. The building deflections under the MCE earthquake in both directions are shown in Figure 4 and 5.

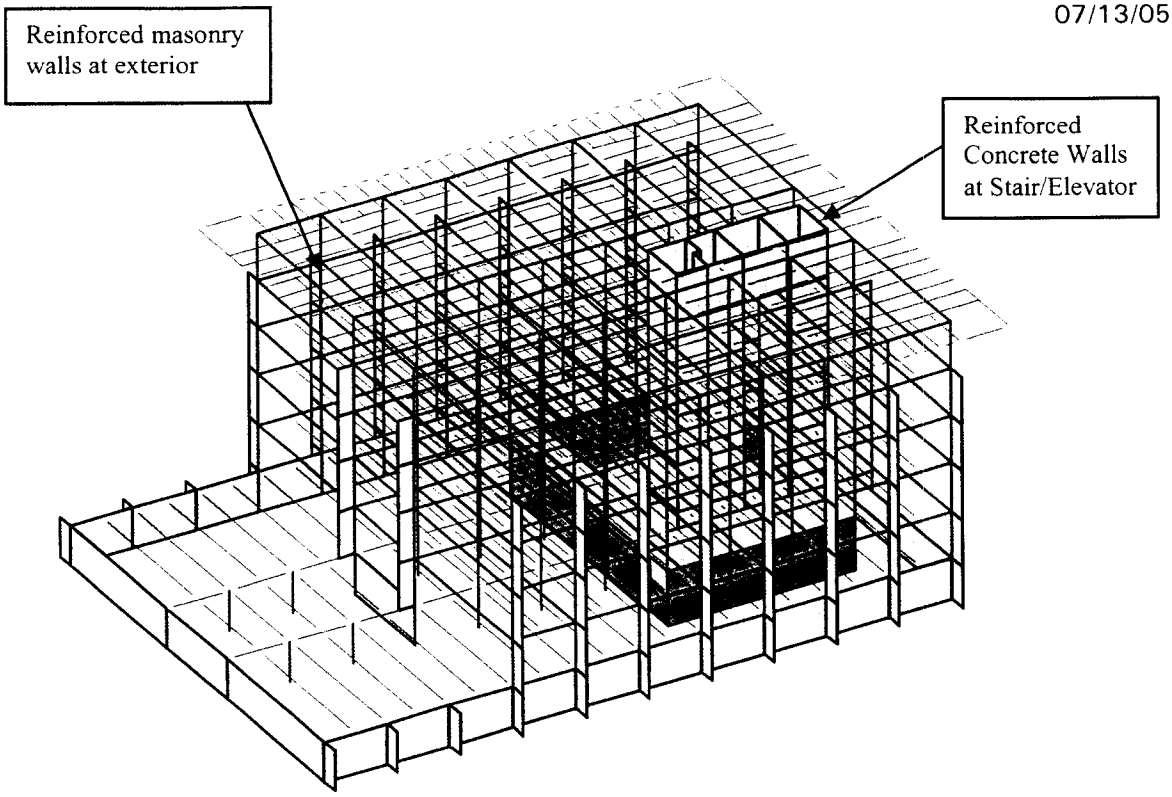


Figure 3 Building Frame System

Deficiencies

The following is a list of the major potential deficiencies identified by the ASCE/SEI 31-03 checklists. The deficiencies are listed in their relative order of importance based upon life-safety considerations, with the lower numbered deficiencies having greater importance. It should be noted that ASCE/SEI 31-03 does not prescribe a relative importance to the checklist elements and therefore, the order of listing is based upon engineering judgments and may not be exact.

1) **Masonry Shear Walls.** The shear stress in the reinforced masonry shear walls/piers is 133 psi, calculated using ASCE/SEI 31-03 quick check procedure, which is greater than 70 psi for Life Safety.
2) **Drift.** The drift ratio of the steel moment frames with reinforced masonry infill, calculated using ASCE/SEI 31-03 quick check procedure, is from 0.098 to 0.15, which is greater than 0.025 for Life Safety.
   The tier 2 analysis of the existing lateral resisting system indicates that there are large interstory drifts in the east-west direction due to the seismic loads. The story drift is 6.9" and that is greater than the allowable story drift of 4.2". Large story drift has the potential to cause extensive structural and nonstructural damage to moment connection, partitions, and claddings. Drifts may also induce large P-Delta demands. The building deflections under the MCE earthquake in both directions are shown in Figure 4 and 5.

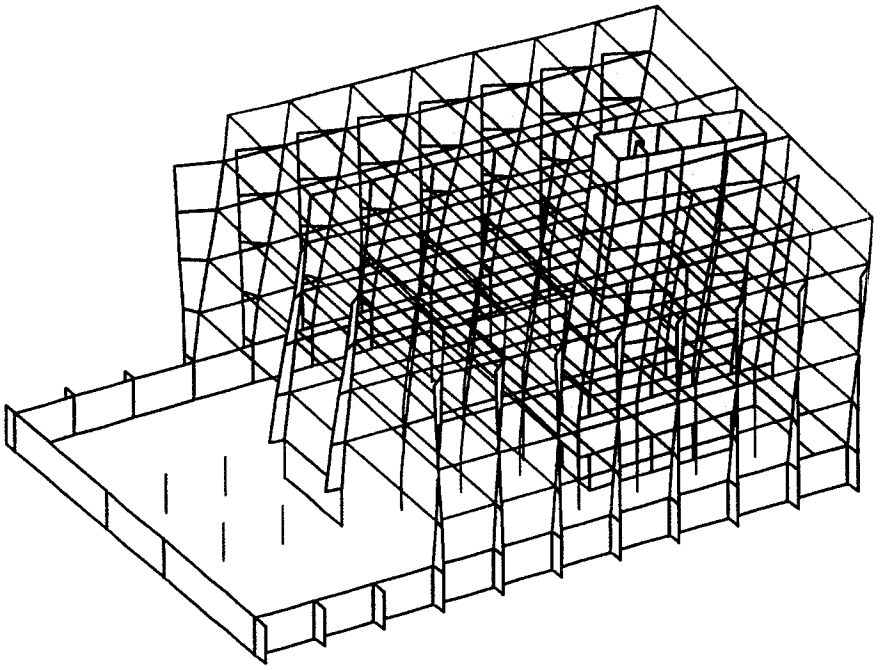


Figure 4, Building Deflection under the MCE in North-South Direction

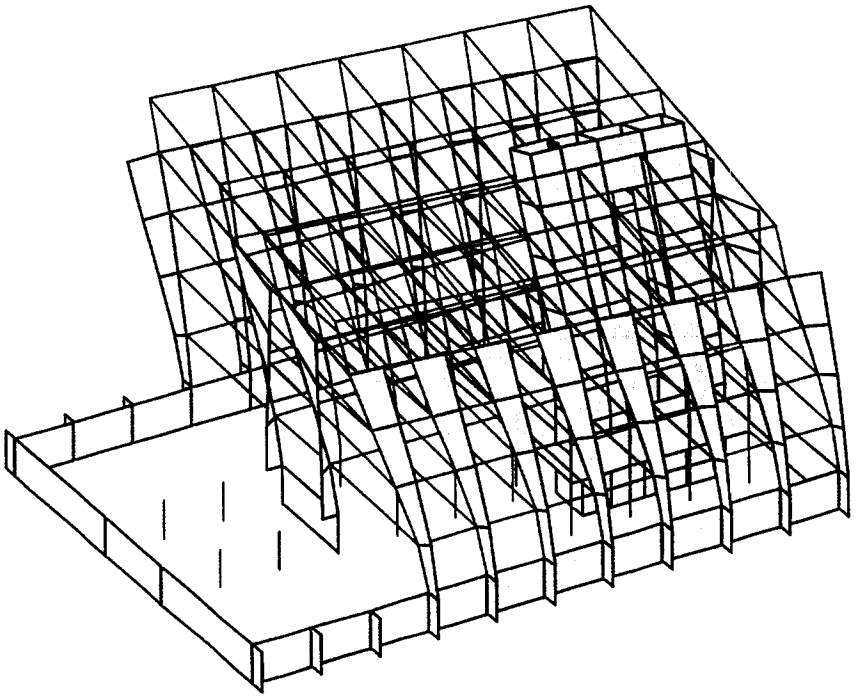


Figure 5. Building Deflection under the MCE in East-West Direction

3) **Moment Frame Connections.** The moment frame connections that were used in the original structure include bolted end plate connection but are not detailed to current standards for moment frames required to resist large seismic forces. The 1994 earthquake in Northridge, California indicated that moment frame connections of this type are susceptible to severe damage or collapse in an earthquake. Thus these types of connections are called pre-Northridge Connections. These connections are susceptible because they tend to fail prematurely. Current moment frame connections are detailed to provide ductility in the beam to column connection. Ductility in the connection enables it to experience load reversals and high rotational demands and still maintain its structural integrity. A typical existing moment frame connection as detailed in the drawings is shown below in Figure 6.

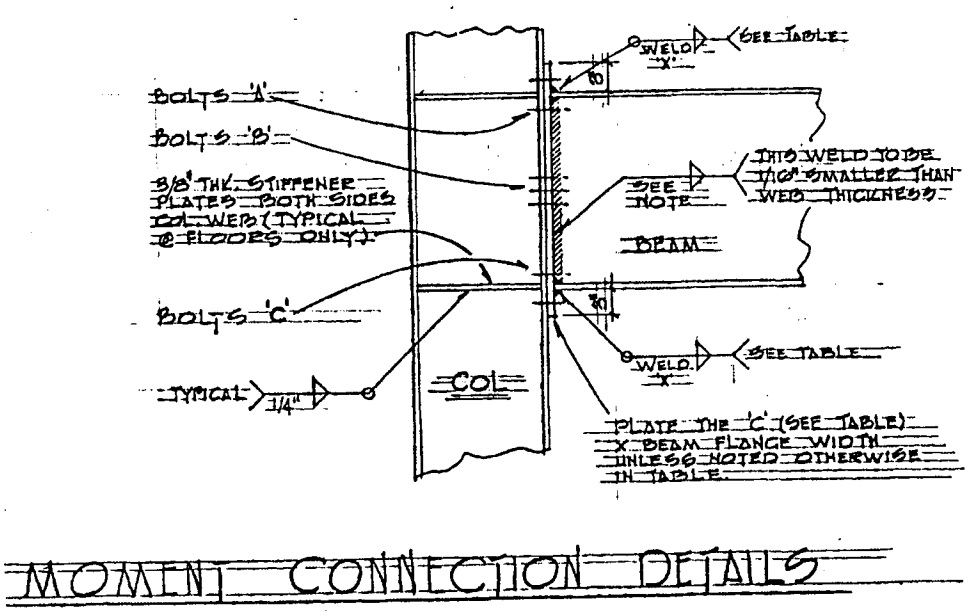


Figure 6 Existing Bolted End Plate Moment Connection

4) **Strong Column/Weak Beam.** The moment frame does not meet the strong column weak beam requirement. This is means that moment frame columns are not strong enough to force hinging in the beams. Column hinging can lead to story mechanism and a concentration of inelastic activity at a single level.
5) **Concrete shear wall.** The shear stresses in the concrete shear walls at stair and elevator shaft is from 150 psi to 400 psi, calculated using ASCE/SEI 31-03 quick check procedure, which is greater than 100 psi for Life Safety.
6) **Torsion.** After the failure of the masonry shear walls at the exterior under large seismic forces, there will be a significant torsion in the building per ASCE/SEI 31-03 quick check. Additional seismic demands and lateral drifts will be imposed on the vertical elements by rotation of the diaphragm.

7) **Non-Structural Elements.** Non-structural elements in the building that are not properly anchored can result in falling hazards to the building occupants. These elements include ceilings, lights, elevators, signs, partition walls, shelving and storage, fire sprinklers, piping, mechanical and electrical equipment, and hazardous materials. Due to the nature of the building, the amount of piping and heavy mechanical equipment is very large, and some of these pipes, such as water piping, pose potentially large hazards. During the site walk through it was noted that most of the piping and many of the other listed elements may not comply with ASCE/SEI 31-03 requirements. It is recommended that all of these elements be checked and properly anchored, braced, and outfitted with flexible couplings at building-to-building, tunnel interfaces, and other strategic locations.

WHW ENGINEERING INC.
CONSULTING
MECHANICAL
ENGINEERS

U of U College of Nursing Master Plan
Mechanical Existing Conditions Report

I. EXECUTIVE SUMMARY

This report prepared by WHW Engineering Inc., is a subset of an overall evaluation prepared by AJC Architects. This facility evaluation is focused on the existing mechanical and plumbing systems to determine their condition, code compliance, life safety and ways to improve, upgrade or replace the existing systems.

The College of Nursing Building was first constructed in 1967.

The major concerns and recommendations for the College of Nursing, located on the University of Utah Campus are as follows:

Heating and Cooling

1. The mechanical system in most of the building is the original system installed in 1967. It is in poor condition and should be replaced. There are two primary options to replace the existing mechanical system. The best overall option is a VAV system with reheat boxes. The most practical solution however, may be the second option which is a dual duct variable volume system.
2. The controls system for the building should be upgraded to a DDC system and tied into the campus head end.
3. All mechanical equipment should be replaced, with the exception of the new equipment on the 5th floor, regardless of which system is used.

Plumbing

1. The majority of the building has the original galvanized piping. It is nearing the end of its life span and should be replaced.
2. The building domestic hot water system has exceeded its recommended service life and should be replaced.

II. FACILITY PROFILE

PLUMBING SYSTEM

Piping	Galvanized steel / copper / cast iron	
Domestic water heaters	Hot Water Convertor	1
	Domestic Hot Water Pumps	1
	Duplex Sump Pump	1
	Drain Piping Cast iron - Bell-n-Spigot; Cast iron – No Hub; Galvanized Steel	
	Process Fluids / Gas Piping	None

HVAC

Heating

Percent Heated	100%
Primary Heat Source	Campus High Temp water converted to building heating hot water

Cooling

Percent Cooled	100%
Primary Cooling Source	Campus chilled water loop
Controls	Pneumatic

Air Distribution

Distribution Type	Constant volume dual duct
Air Handler Quantity	1
Return / Relief Fan	1
Heating / Cooling Media	Hot water coil/ chilled water coil

Other HVAC Components

HVAC Pumps	
Heating Hot Water Pumps	2
Heating Hot Water Coil Pumps	2
Chilled Water Pump	1

III. DESCRIPTION OF MECHANICAL SYSTEM

A. HEATING SYSTEMS

The College of Nursing Building, located on the University of Utah Campus, in Salt Lake City, Utah is currently heated by high temperature water from the campus central heating plant. High temperature water is routed to a shell and tube hot water converter located in the lower level mechanical room. This converter was installed in 1967. High temperature water supply line to the building is 3".

1. Distribution System

a. Heating hot water is pumped through a two pipe direct return system to hot water coils located within the following:
   1) One air handling unit.

2. Other Existing Heating System Equipment

a. Two base mounted, closed coupled, end suction hot water distribution pumps.
b. One ceiling mounted horizontal type compression tank.
c. Two hot water coil circulating pumps.

3. Condition of Existing Heating Equipment

a. Convertor is 37 years old and has exceeded ASHRAE's recommended service life of 24 years.
b. Hot water piping insulation is in fair condition throughout the building.
c. The main hot water distribution pumps are in fair condition and have exceeded ASHRAE's recommended service life.
d. Water treatment and piping is provided but needs to be upgraded.
e. Compression tank is beyond ASHRAE's recommended service life.
f. The air handler hot water coils are in fair condition and have exceeded ASHRAE's recommended service life.
g. Hot water piping is in fair condition.
h. Hot water piping insulation is in fair condition, but likely contains asbestos.

B. Cooling System

Cooling for the building was originally provided by one water cooled chiller in the lower level mechanical room. It is currently supplied by the central plant.

1. Distribution System

a. Chilled water piping is routed to chilled water coils located within the main air handling unit.

2. **Other Existing Cooling Equipment**

a. One base mounted closed coupled chilled water pump.
b. One base mounted closed coupled condenser water pump.
c. One exterior cooling tower.
d. Chilled water piping from central plant.

3. **Condition of Existing Cooling Equipment**

a. The chiller is in poor condition and has been abandoned.
b. The cooling tower is in poor condition and has been abandoned.
c. The pumps are in fair condition and have exceeded ASHRAE's recommended service life.
d. The air handler chilled water coils are well beyond ASHRAE's recommended service life.
e. Chilled water piping is in fair condition.
f. Chilled water piping insulation is in fair condition, but likely contains asbestos.

C. **Ventilation Systems**

1. **Air Distribution System**

a. Conditioned and fresh air is distributed to the building by one air handling unit located in the lower floor mechanical equipment room.
b. Medium pressure ductwork distributes the heating and cooling air to dual duct mixing boxes.
c. Low pressure ductwork distributes air from mixing boxes to diffusers.
d. Return air consists of a plenum return system from each floor to the central return air shaft.
e. The air handling unit is equipped with a hot deck hot water coil and a cold deck chilled water coil.
f. Air distribution is a dual duct box arrangement supplied from a single heating and single cooling duct. Each box is controlled by a pneumatic zone thermostat.
g. Return / relief air is pulled from the return air shaft and routed to a return / relief air plenum.

2. **Ventilation System**

a. Fresh air is introduced into the building through a fresh air well and louver at the east side of the southeast corner of the building.
b. The toilet rooms are exhausted by roof mounted exhaust fan serving a central exhaust duct in an exhaust shaft.

3. **Relief Air System**

a. Relief air motorized dampers are provided in the lower floor

mechanical equipment room. Air is relieved through a relief air louver and well at the south side of the southeast corner of the building.

4. **Condition of Air Distribution Systems**

   a. The exhaust fans are in fair condition.
   b. The main air handling unit is in poor condition, and well beyond ASHRAE's recommended service life. A preliminary balance reading shows that the air handler is operating at 89% of design.
   c. Exterior louvers and dampers are in fair condition.
   d. Existing medium pressure ductwork in shaft and mechanical rooms is in good condition.
   e. Existing ductwork at each floor is in fair condition.

5. **Air Terminal Units**

   a. The low pressure supply air is routed to ceiling mounted diffusers, side wall registers, and floor registers.
   b. Return and exhaust grilles are ceiling, and sidewall mounted.

6. **Condition of Supply, Return and Exhaust Air Systems**

   a. The supply air ceiling diffusers are in poor condition.
   b. The exhaust grilles are in poor condition.
   c. The return grilles are in poor condition.

D. **Automatic Temperature Control Systems**

1. The building control system is a pneumatic system manufactured by Johnson Controls.
2. The heating control valves serving the air handling unit are three way valves.
3. All fresh air and return air dampers serving the air handling units are controlled by pneumatic controllers.
4. Condition of Existing Control System
   a. The existing control system is in poor condition and outdated.
   b. The control valves are in poor condition.
   c. Air compressor is in good condition, although the system is at its maximum capacity. It should be replaced with a larger compressor if the pneumatic system is going to remain in use for the future.

E. **Plumbing Systems**

1. **Plumbing fixtures installed in the building consist of the following:**

   a. Wall mounted water closets with flush valves (not handicapped).
   b. Wall mounted water closets with flush valves (handicapped).
   c. Wall mounted lavatories (not handicapped).
   d. Wall mounted lavatories(handicapped).

e. Bi-level refrigerated drinking fountain - wall hung (majority of which do not comply with current ADA requirements)
f. Single compartment sink - porcelain - counter mounted.
g. Insulation kits for waste and water provided.
h. Double Compartment sink - stainless steel - counter mounted.
i. Showers

2. **Existing Water Heater**

a. The main water heater located in the lower mechanical equipment room, is a storage type vertical tank fed by a hot water convertor.

3. **Existing Water Distribution System**

a. Culinary water is brought to the building in the lower mechanical room. Pipe service size is 4". Two PRV valves are provided at the water header.
b. Water service piping serves the building culinary water system, hot water heating make-up system, chilled water make-up system, condenser water system, and culinary hot water system.
c. Piping is a combination of galvanized and copper.

4. **Existing Sewer System**

a. The existing sanitary sewer piping is cast iron. It runs out of the building to a common line south of the building. The common line runs west and increases to 6".
b. The existing vent piping is cast iron and galvanized steel.
c. The floor drains on the lower level run to a duplex sump pump, and are pumped back into the building sanitary sewer line.

5. **Roof Drainage**

a. Roof drains are routed to common roof drain stacks, and tied together; they exit the building on the west side and tie into a storm drainage line.

6. **Condition of Existing Plumbing**

a. The water heater is in poor condition, and has exceeded its recommended life.
b. Culinary water piping is galvanized with the exception of some new copper on the 5th floor and a cast iron main from the street. The galvanized piping is in fair to poor condition.
c. Culinary water piping insulation is in fair condition, but likely contains asbestos.
d. Plumbing fixtures are in good condition except for the age of the fixtures.
e. Drinking fountains are in fair condition but most of them do not comply with current ADA guidelines.
f. ADA issues regarding the restrooms and drinking fountains must

be addressed.

SPECTRUM
ENGINEERS

Memorandum

To:	Jill Jones	**Telephone:**	(801) 466-8818
Company:	AJC Architects	**Fax:**	(801) 466-4411
	703 East 1700 South		
	Salt Lake City, Utah 84105	**Copies to:**	
From:	Dave Wesemann	**Telephone:**	801-401-8468
Job:	College or Nursing Masterplan	**Toll Free:**	800-678-7077
Re:	Existing Conditions Report	**Fax:**	801-401-9468
Job Number:	20040850.dew	**E-mail:**	dew@spectrum-engineers.com
Date:	July 13, 2005	**Page:**	1 of 4

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☑ e-Mail	☐ Enclosure	☐ Fax	☐ Other

The following is an assessment of the electrical systems existing conditions at the U of U College of Nursing Building:

SITE UTILITIES

Medium Voltage

The Nursing Building is served from the campus 7,200 volt system through a duct bank to a manhole that is southwest of the building. The campus is phasing out the 7,200 volt system and converting buildings over to the 12,470 volt system as opportunities arise. Following this direction, the Nursing Building should be converted to the 12,470 volt system as part of the Master Plan. One possible source of this service is a duct bank system that was installed as part of the new Health Sciences Education building project. The duct bank contains a 12,470 volt feeder from the Red Butte substation and can be accessed through a manhole that is approximately 300' to the south and 50' to the east of the Nursing Building.

The high-voltage vault for the building is located in the lower parking level. It contains oil fused cutouts and a 1,000 kVA transformer bank, consisting of 3 ea. 333 kVA single-phase pole-type transformers. Secondary voltage to the building is 120/208V, 3-phase, 4-wire. Signs on the transformers indicate that they do not contain PCB's. At least one of the transformers shows signs of leakage. The vault appears very tight, where safe working clearances are compromised. As part of the conversion to the 12,470 volt

system, the recommendation is to construct a new, larger vault and provide new transformers and 15 kV vacuum fault interrupter switch.

Telecommunications

As-built documents indicate that the building is served with six 2" conduits from a manhole on the southwest for telecommunications and auxiliary systems. The current standard for the Campus is to use all 4" conduits and, where possible, provide service from a redundant manhole/duct bank system. The existing 2" conduit duct bank can be left in place and used to the extent possible, with a new duct bank consisting of 4" conduits to a separate manhole. One such manhole is located on the northeast side of the building, but there may be other possibilities as this is explored further with the Campus Netcom department.

BUILDING SERVICE AND DISTRIBUTION

Main Service

The main low-voltage gear is located in an electrical room adjacent to the high voltage vault. The main service consists of 120/208 volt, 3,000 amp main-lug-only gear, with two 1,600 amp switches, one for the building distribution of lights and convenience power, and the other for the motor control center serving the main HVAC loads of the building. The main gear appears to be original equipment and is obsolete. This gear should be replaced as part of the Master Plan. This building is rather large for a 120/208V system (not having 277/480V). During the programming and design phase, an evaluation should be made to determine if it would be more cost effective and efficient to change to a 277/480V system. This would depend primarily on the extent of the mechanical system changes and should be considered as part of the overall systems scheme.

Distribution

The branch panelboards that serve the lights and outlets on each floor are located in small, stacked electrical closets on each floor. The panelboards are full of circuits, with little (if any) room to add more circuits. The closets are full of panelboards and conduit with little room to add more panels. The panelboards are original equipment and obsolete. New, larger electrical rooms on each floor are recommended containing all new panels and distribution. Ample panelboard space should be provided to accommodate the power needs of a modern office and educational environment.

Emergency Service and Distribution

A small, 30 kW diesel generator is located indoors, on the lower parking level. There is one emergency panel fed from this generator that serves mainly emergency lighting and fire alarm. The emergency lighting in the building is inadequate to meet today's code-minimum levels, and will need to be upgraded. The generator is not sized for the other loads that are required to have emergency power according to the latest codes. For example, the elevators will require emergency power as part of the building upgrades, which will require a new, larger generator. Whether the generator is located in a larger room in the lower parking level, or outside in a separate enclosure, will need to be evaluated during the programming and design phases of the project.

LIGHTING

Interior Lighting

Interior spaces are illuminated with fixtures that predominantly use the 4' T12 fluorescent lamp. Most fixtures appear to be original. Many of the acrylic lenses on the fixtures are damaged or have become yellowed. Some newer fixtures exist in areas of the building that have been remodeled since the original construction. A general lighting upgrade with new fixtures and energy-efficient lamps and ballasts is recommended for energy efficiency and to improve the overall quality and functionality of the lighting.

Lighting controls are mostly manual wall switches. Newer energy codes require the use of automatic controls throughout the building. Lighting controls inside of classrooms can be enhanced by using programmable dimming/control systems that can be interfaced to new audio/visual controls.

Exit lights appear to be mostly original, using either incandescent of fluorescent lamps. These should all be replaced with LED type exit signs for energy efficiency and longevity.

Parking, Pedestrian, and Street Lighting

The building is surrounded by the old campus standard light pole, which is a clear globe on a 10' pole. In another project, many of these fixtures are being replaced by a new light pole standard that was selected for the medical (east) campus area. It is a cut-off fixture with higher performing optics. Any remaining poles that have not been replaced should be replaced as part of the Nursing Building master plan. All new exterior lighting should be cut-off type and spaced to maintain the minimum, safe lighting levels that are standard for the campus.

FIRE ALARM

Building Fire Alarm System

The original fire alarm system is currently being replaced and upgraded in a separate project. New detectors, audible/visual alarms and wiring are being provided throughout. The audible devices are horns, which would have to be changed out to voice evacuation per the International Codes if an atrium is to be added to the building. Being new, this system will remain in place to the extent possible and be modified / expanded as needed for the new work of the Master Plan. All new work shall comply with Campus and State Fire Marshal Rules and Regulations. Only fire alarm systems from Nelson Fire are allowed on campus.

The new fire alarm/sprinkler system is being installed below the ceilings due to asbestos abatement costs. As the asbestos above the ceiling is abated, the fire alarm conduit and sprinkler piping systems should be remodeled (above the ceilings).

TECHNOLOGY SYSTEMS

Telecommunications

Telephone/data backboards, cables and equipment are located in small closets that are stacked on each floor. The sizes of the closets are grossly undersized to meet modern-day telecommunications standards. New, stacked telecommunications closets are recommended, sized to meet the current standards. Some cable tray exists in the building. Distribution and support of new cables has been difficult due to the presence of asbestos. As part of the new plan, all new cable trays and empty raceways are needed. The Campus Netcom will provide all the cabling and terminations. All new cabling will be provided to meet the latest standards for high-speed data communications. Wireless networking capabilities will also be provided in the building.

Clock System

The existing clock system consists of hard-wired, recessed clocks that are synchronized through a power-line carrier signal. This type of clock system is being phased out of the campus. The system is maintained, however, any new work in remodeled or new buildings should use the new campus clock standard, which is battery operated clocks that are synchronized via a wireless satellite signal.

Security

A minimal amount of electronic security exists in the building by way of a card-entry system at the exterior doors. Some of the doors in the building have stand-alone, number-code access keypads. The older card access systems on campus are being replaced by a new Johnson Controls security and card access system. There are some existing CCTV cameras in the parking structure. There is also an older style emergency telephone in the parking area that should be replaced with the new campus-standard style.

Audio/Visual

One large lecture room is equipped with an audio/visual system that appears to provide the needed functionality for that room. Other classrooms in the building do not have much by way of audio/visual. A project is currently under way to equip additional rooms with modern A/V systems consisting of projectors, source devices and integrated control systems. All new instructional and meeting spaces in the Master Plan should be considered for a full compliment of audio/visual devices and control systems. Electronic systems for distance education access will also be an important part of the functionality of the building.

END OF REPORT

Projected space needs are based on input received through a series of focus group sessions. The attendees were asked to provide information on current space deficiencies and to project future space needs to accommodate anticipated growth. This input was developed and converted by ajc architects into a spreadsheet format which included quantities and area estimates for requested functions. A degree of associated qualitative information is also captured, which can be used as a starting point for programming phases. The initial draft of this spreadsheet was reviewed and slightly adjusted by key members of the steering committee. This spreadsheet is provided as

FIGURE 14: ADDITIONAL SPACE NEEDS AND REQUESTS.

Also considered in the space need evaluation are spaces that will be vacated and available for new use. This category of space includes spaces that will be accommodated in the new Health Sciences Education Building (HSEB). Since HSEB is primarily a student centered classroom building, several classrooms currently in the College of Nursing will not be needed any longer as they will be replaced by more modern and improved classrooms in the new building. Further examples of space that is anticipated to be moved elsewhere over time are clinical spaces such as Caring Connections. This information is provided in the following table:

FIGURE 15: AREA ANTICIPATED TO BE AVAILABLE FOR NEW USE.

The additional space need was also organized according to use and category to facilitate logical zoning in the master plan options. This table is provided as:

FIGURE 16: SPACE SUMMARY BY CATEGORY.

FIGURE 14 Additional Space Needs & Requests

*Efficiency at: 17%

space type/name	quantity	# of occ	SF/occ	SF/space	total net	Gross SF*	notes:
Central Administration/General Use							
Office-New Assoc Dean	1	1	144	144	144		Information & Technology (Carole Gassert)
Student Services Office	1	1	110	110	110		
Student Services Copy/Workspace	1	0	na	120	120		
Student Services File Room	1	0	na	96	96		Must be secure.
Serving Kitchen	1	0	na	200	200		Plaza level-Next to reception space.
Reception Area	1	40	12	480	480		Plaza level-Enlarge lobby area to work for receptions.
Alumni Space/Gamma Rho-	1	na	na	144	144		Off of reception area.
Staff Lounge	1	16	25	400	400		Staff requested a separate lounge area in which they can have a true break from interruptions and demands of admin/faculty.
				subtotal	**1,694**	**1,982**	

FIGURE 14 Additional Space Needs & Requests

*Efficiency at: 17%

space type/name	quantity	# of occ	SF/occ	SF/space	total net	Gross SF*	notes:
Clinical Practice							
Shared Full-Time Clinical Faculty Office	4	2	64	128	512		These are for clinical faculty that spend majority of time at off-site clinics. Shared office with 2 computers, private zone, shared zone. Currently 62 full time clinical. At 10-15% growth allow for 8 additional people.
Shared Part Time Clinical Faculty Office	1	4	42	168	168		These are for clinical faculty that spend majority of time at off-site clinics. Shared office with 4 computers, private zone, shared zone. Currently 24 part time clinical faculty. At 10-15% growth allow for 3 additional people.
Shared space for Clinical Faculty Associates (CFA)	1	10	42	420	420		Shared room with work spaces and lockers, work space/meeting area, similar to 5th floor doctoral space. Issue (unresolved) with how to achieve phone privacy without providing small private office. According to notes allow for 10 additional.
				subtotal	**1,100**	**1,287**	

FIGURE 14 Additional Space Needs & Requests

*Efficiency at: 17%

space type/name	quantity	# of occ	SF/occ	SF/space	total net	Gross SF*	notes:
Research							
Research Faculty Offices	3	1	120	120	360		Currently 19.5 research faculty offices on 5th floor. At 10-15% growth allow 3 additional.
Research File/Work Room	1	0	na	144	144		
Research Conference Room	1	10	25	250	250		
Research Interview Room	2	4	30	120	240		
Research Assistant Space	12	1	56	56	672		Systems furniture cubicles.
Post Doctoral Space	8	2	64	128	1,024		Shared office with 2 computers, private zone, shared zone, allowing enough additional offices to also accommodate visiting VIPs, temp faculty.
Faculty/Student Private Meeting Room	2	4	30	120	240		Overflow rooms for faculty or post-doc's to meet privately with students when shared offices have conflicts. Can these double as research interview rooms?
				subtotal	**2,930**	**3,428**	

FIGURE 14 Additional Space Needs & Requests

*Efficiency at: 17%

space type/name	quantity	# of occ	SF/occ	SF/space	total net	Gross SF*	notes:
Teaching Education Learning Student Space							
Classrooms/Labs							
75 Person Classrooms	2	75	23	1725	3,450		
Seminar rooms for 15-20	2	20	20	400	800		
Small Group Break-out Rooms (for 6-10)	4	10	20	200	800		Will not exist in HSEB. Intent is that 75 person class could break out into smaller groups in these rooms, so must be nearby larger classroom(s).
Learning Resource & Simulation Center					6,063		Based on program document (ajc Nov. 2004), difference between current area (4,600) and programmed net space need (10,663).
				subtotal	**11,113**	**13,002**	
Offices/Support							
Full-time Faculty Offices	12	1	144	144	1,728		
Shared Part-time Faculty Offices	8	2	64	128	1,024		Shared office with 2 computers, private zone, shared zone, allowing enough additional offices to also accommodate visiting VIPs, temp faculty.
Faculty/Student Meeting Room	2	na	na	120	240		Overflow rooms for faculty or TA's to meet privately with students when shared offices have conflicts. These may double as research interview rooms.
Teaching Assistant Space	1	10	42	420	420		Shared room with work spaces and lockers, work space/meeting area, similar to 5th floor doctoral space.
				subtotal	**3,412**	**3,992**	

FIGURE 14 Additional Space Needs & Requests

*Efficiency at: 17%

space type/name	quantity	# of occ	SF/occ	SF/space	total net	Gross SF*	notes:
Public Circulation/Mechanical/Custodial/Restrooms							
Exit Stair					1,600		Assumed 40'x10' x 4 levels
Restrooms					1,000		There is a lack of men's restrooms. There are problems with accessibility. Estimated space need at about 200 SF per floor.
Stacked Telecom Rooms					300		Estimated space need at about 60 SF per floor
Larger Electrical Rooms					300		Estimated increase at 60 SF per floor
Shower/Changing/Locker					440		Intended for general Health Sciences use with card key access required. Multiple stall per gender. Try to locate next to/off of public use restroom.
Bridge to HSEB					0		To be handled as an isolated element with separate cost estimate etc.
Fix access to first level					250		Stair between first and second level.
Entrance to west or north					450		Vestibule, small lobby and circulation space needed. Depends largely on approach/solution.
				subtotal	**4,340**	**4,340**	No efficiency factor added.
Other/Wall thickness							
Seismic Upgrade					200		Anticipate that depending on approach, seismic upgrade would require some square footage associated with it, though probably not much.
				subtotal	**200**	**200**	No efficiency factor added.

PROJECTED ADDITIONAL GSF NEED	**28,231**
Minus space in building anticipated to be available for new use:	**11,802**
Approximate size of "Addition" Needed:	**16,429**

FIGURE 15 Area Anticipated to be Available for New Use

room number	name	current use/description	notes	NASF
102	Patient Waiting Room	waiting room for caring connections	it is anticipated that clinical uses will eventually be migrating off-site to research park or elsewhere in keeping with general Health Science Area/Campus goals	324
103	Storage	admin storage	consolidating space currently devoted to storage will be accomplished through digitizing files and getting rid of "junk".	107
110	Restroom	small single user restroom	restroom does not meet ADA. Adequate restroom facilities provided by rooms 121 and 126, though they need to be upgraded and made accessible.	25
122	Counseling	Psychiatric Family Medicine	it is anticipated that clinical uses will eventually be migrating off-site to research park or elsewhere in keeping with general Health Science Area/Campus goals	127
123	Staff Office	clinical staff, billing etc for offsite clinics stg of records	it is anticipated that clinical uses will eventually be migrating off-site to research park or elsewhere in keeping with general Health Science Area/Campus goals	338
113	Staff Office	caring connections staff	it is anticipated that clinical uses will eventually be migrating off-site to research park or elsewhere in keeping with general Health Science Area/Campus goals	162
114	Conference Room	conference room for caring connections	it is anticipated that clinical uses will eventually be migrating off-site to research park or elsewhere in keeping with general Health Science Area/Campus goals	160
115	Restroom	restroom	adequate restroom facilities provided by rooms 121 and 126, though they need to be upgraded and made accessible.	40
116	Restroom	restroom	adequate restroom facilities provided by rooms 121 and 126, though they need to be upgraded and made accessible.	40
119A&B	W Shower	women's private shower	under-utilized. Preference to provide health sciences use multi user showers locker changing available.	55
119D&C	M Shower	men's private shower	under-utilized. Preference to provide health sciences use multi user showers locker changing available.	55
120	Kitchen	staff coffee sink area	under-utilized. Intent is to provide a general staff lounge to replace this function.	86
127	File	unknown storage	consolidating space currently devoted to storage will be accomplished through digitizing files and getting rid of "junk".	54
	1st Floor subtotal			**1,573**

FIGURE 15 Area Anticipated to be Available for New Use

room number	name	current use/description	notes	NASF
201	Classroom	classroom	Outdated, unpopular for teaching.	644
202	Classroom	classroom	Outdated, unpopular for teaching.	1,196
203	Classroom	classroom	Outdated, unpopular for teaching.	313
205	Classroom	classroom	originally intended to be classroom to teach home healthcare. not used that way now. Not a popular classroom to teach in. not anticipated to be needed due to HSEB.	1,171
205A	kitchen	home health care kitchen	not used for original intent, under-utilized. Likely to expand and reconfigure to use as serving area for receptions.	[redacted]
205B	storage	stg for classroom 205		
205C	Restroom	home health care RR	underutilized. Not appropriate location.	
206	Lounge	Lounge staff	too small, no windows, underutilized, need better staff lounge with sink tables chairs etc.	
207	storage	Storage	consolidating space currently devoted to storage will be accomplished through digitizing files and getting rid of "junk".	121
208	Storage	Storage	consolidating space currently devoted to storage will be accomplished through digitizing files and getting rid of "junk".	93
214	Classroom	classroom	Outdated, unpopular for teaching.	448
216	Seminar Room	classroom	Outdated, unpopular for teaching.	328
217	Classroom	classroom	Outdated, unpopular for teaching.	784
218	Classroom	classroom	Outdated, unpopular for teaching.	528
2nd Floor subtotal				**6,044**

FIGURE 15 Area Anticipated to be Available for New Use

room number	name	current use/description	notes	NASF
302	Student Computer Lab	computer lab with open access general use computers as well as computers used for simulation.	adequate open general use computers will be available at new HSEB. Anticipated that traditional computer station use will be diminishing with the increased use of laptops and tablet PC's. Computers used for simulation are included in LR&SC program.	1,108
303	Informatics Lab/Classroom	Informatics Lab/Classroom	This function is incorporated into new HSEB	942
317	Classroom	Classroom	General use classroom not needed in light of HSEB. Note: Classroom devoted to LR&SC use is included in LR&SC program.	184
	3rd Floor subtotal			**2,234**
415	Faculty Lounge	lounge shared by faculty staff admin	Currently there is general shared staff/admin/faculty lounge space on 4th floor and 5th floor. Preferred would be a separate faculty/admin lounge and a separate staff lounge. Staff needs a place to have a true break from faculty and admin interruptions and demands.	796
460	Computer Classroom	computer classroom, training	computer classrooms are available in HSEB	276
	4th Floor subtotal			**1,072**

FIGURE 15 **Area Anticipated to be Available for New Use**

room number	name	current use/description	notes	NASF
580	Classroom	Classroom	Classroom does not function well. Location of larger classrooms preferred on plaza level. No longer necessary in light of HSEB and 2nd Floor Plaza level remodel.	879
	5th Floor subtotal			**879**
	Total NASF Available for reuse			**11,802**

SUMMARY OF AREA AVAILABLE FOR NEW USE BY CATEGORY/FUNCTION

Central Administration	**1,117**
Clinical Practice	**787**
Research	**0**
Teaching Education Learning	
Classrooms/Labs	8,801
Offices/Support	**0**
Circulation Mech Restrooms Custodial	**105**
Walls, Others	574
Total NASF Available for reuse	**11,802**

Figure 16 Space Summary by Category-Totals

Category	Current Area (NSF)	Space Available for new Use	current area minus space to be vacated	Projected Additional Need (NSF)	17% Efficiency Factor on additional need	Total (GSF)
Central Administration/General Use	7,755	1,117	6,638	1,694	288	**8,620**
Clinical Practice	1,180	787	393	1,100	187	**1,680**
Research	6,630	0	6,630	2,930	498	**10,058**
Teaching Education Learning Space						
Classrooms/Labs	18,284	8,801	9,483	11,113	1,889	**22,485**
Offices/Support Spaces	8,510	0	8,510	3,412	580	**12,502**
[redacted]	2,738	418	2,320	0	0	**2,320**
total current net area	**45,097**					
Public Circulation/Mechanical/ Custodial/Restrooms	22,243	105	22,138	4,340	0	**26,478**
Other/Wall thickness	10,122	574	9,548	200	0	**9,748**
total current gross area	**77,462**				**projected gross area**	**93,891**
Difference between current GSF and projected GSF=						**16,429**

Architectural

Early in the master planning process the steering committee reached a rapid consensus that the preference for the College of Nursing is to remain in ITS current location. At the visioning session, the few remaining areas identified in the Long Range Development Plan as new building sites in the Health Sciences Campus were reviewed as possible alternative locations for new College of Nursing Facilities. However, these options offered no significant advantage over the current location, and in most ways were felt to be inferior. The current site offers an ideal location for the College, centrally located in the Health Sciences Campus. The existing building is located adjacent to the Medical Library, is very proximate to the Hospital and is also close to the research corridor. The existing building is highly visible, prominent and relatively easy to find.

Consideration was given to the desirability and feasibility of demolishing the current building and constructing a new building in the approximate original footprint to be designed optimally for current and projected need. It was quickly decided that the cost of relocating the College in temporary facilities would be expensive and extremely inconvenient. Furthermore, the College of Nursing felt that the current building was not unattractive, and if upgraded, code deficiencies corrected, the interior significantly altered, and the building enlarged, it could effectively serve their needs through the foreseeable future. Many in the College of Nursing are positively attached to the building and feel it carries with it a valuable history that should be respected and appreciated. At the same time, some expressed concern that the existing building could appear "dowdy" next to the new HSEB. The consensus opinion is that exterior additions to the building, including and seismic upgrades (such as cross-bracing) may be exposed and expressive of the technology of today. These alterations could also serve as a visual tie to the HSEB, yet should not detract from the aesthetic of the original building.

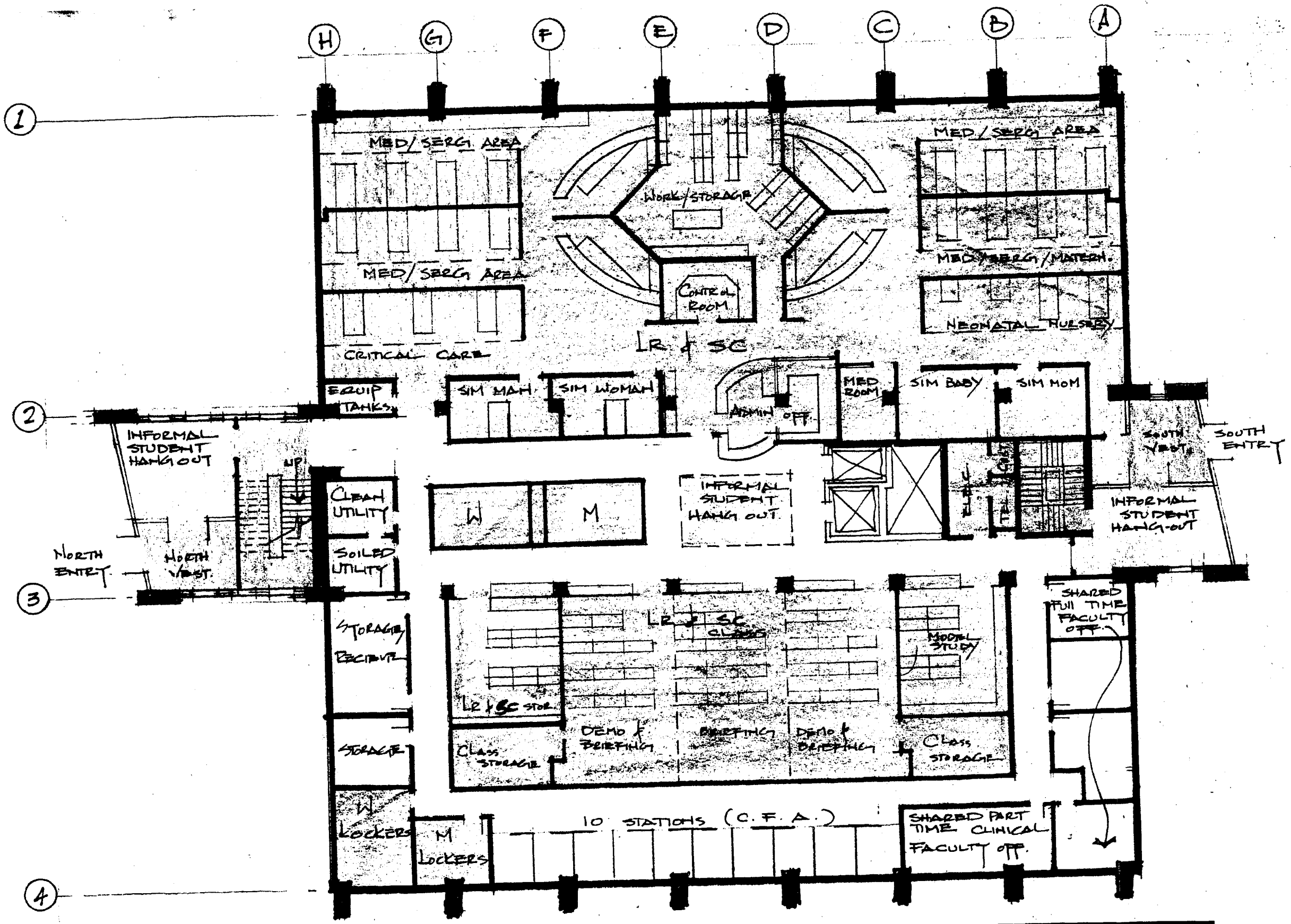
Three master plan options were developed to restack (reorganize and rezone) the building and provide the additional required and requested space in the current vicinity. Of the three, Option A was the overwhelming favorite. Improvements to the preferred option were suggested and incorporated and the results are shown on the floor plan graphics included. See

FIGURE 17: PREFERRED OPTION-LEVEL ONE PLAN
FIGURE 18: PREFERRED OPTION-LEVEL TWO PLAN
FIGURE 19: PREFERRED OPTION-LEVEL THREE PLAN
FIGURE 20: PREFERRED OPTION-LEVEL FOUR PLAN
FIGURE 21: PREFERRED OPTION-LEVEL FIVE PLAN

These master plans are conceptual in nature and are intended to provide a general massing, organizational and zoning framework that will require in depth development during the programming and design project phases as the master plan is implemented over time.

The other options (B & C) are included in the appendix for reference.

Following are the preferred options and recommendations from the structural, mechanical, and electrical consultants regarding the improvements and upgrades to the building.



THE UNIVERSITY OF UTAH

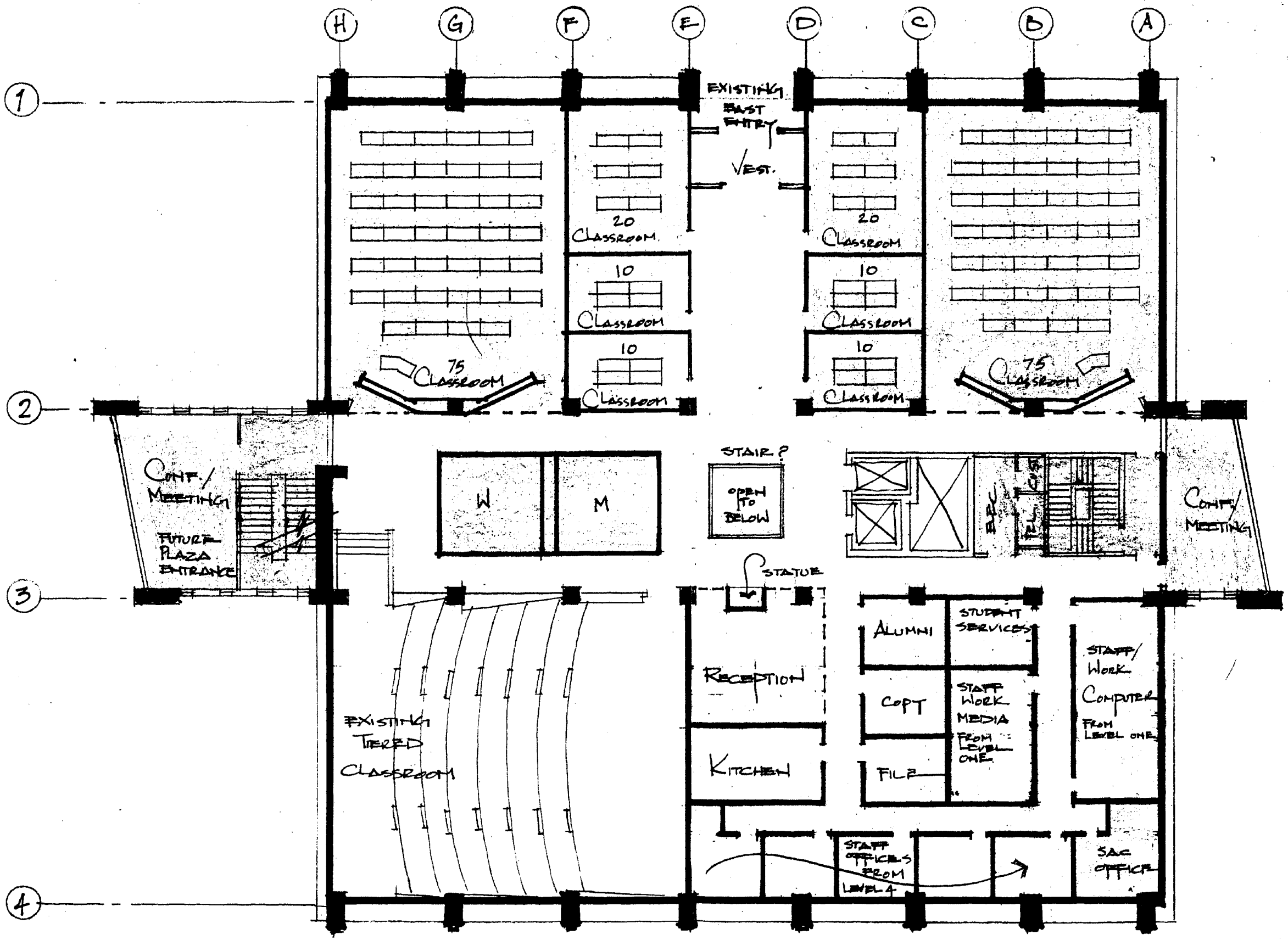
College of Nursing Master Plan - Figure 17

Preferred Option - Level One Plan

July 2005

0' 4' 8' 16'

ajc architects



THE UNIVERSITY OF UTAH

College of Nursing Master Plan - Figure 18

Preferred Option - Level Two Plan

July 2005

0' 4' 8' 16'

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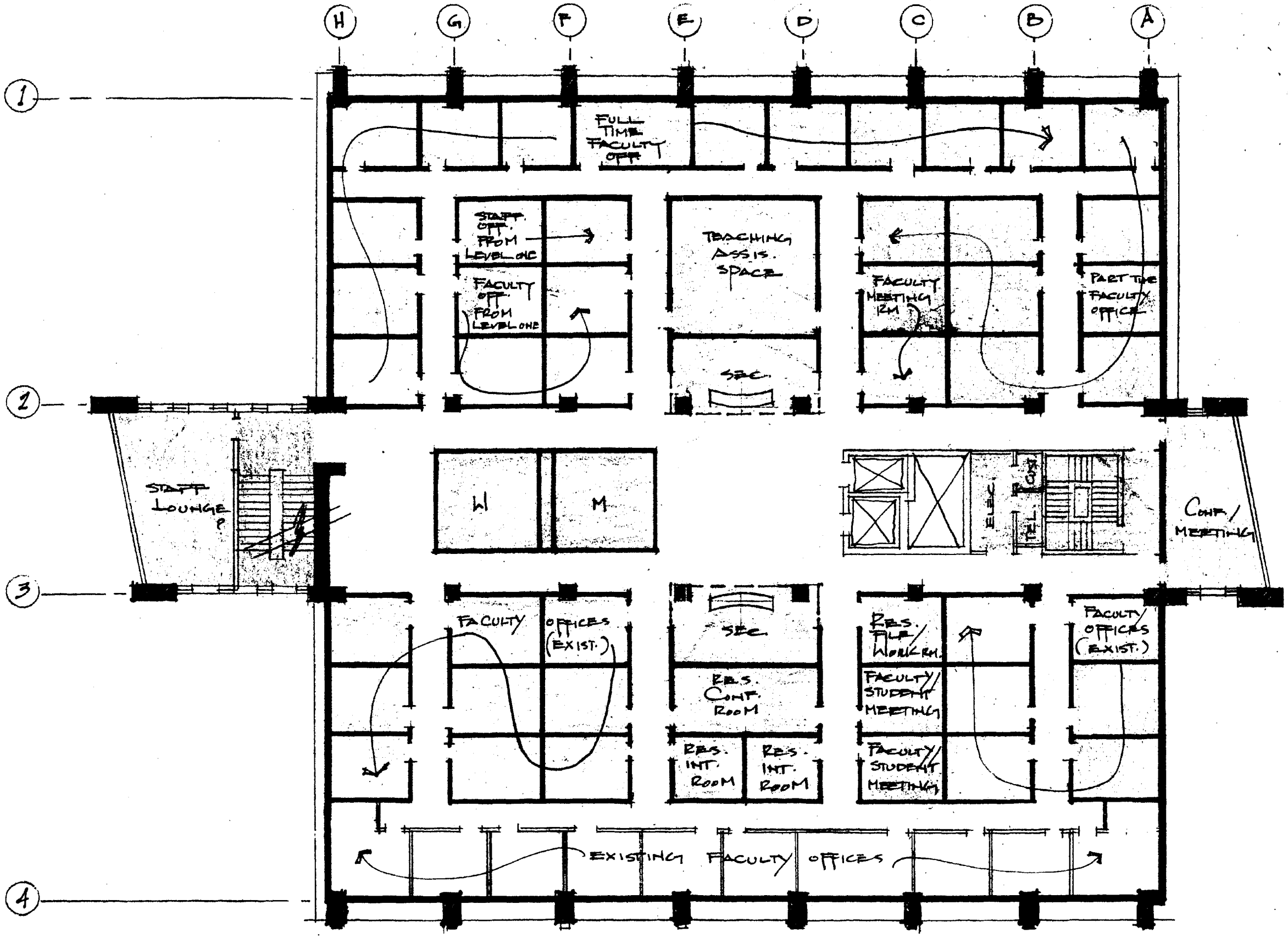


THE UNIVERSITY OF UTAH

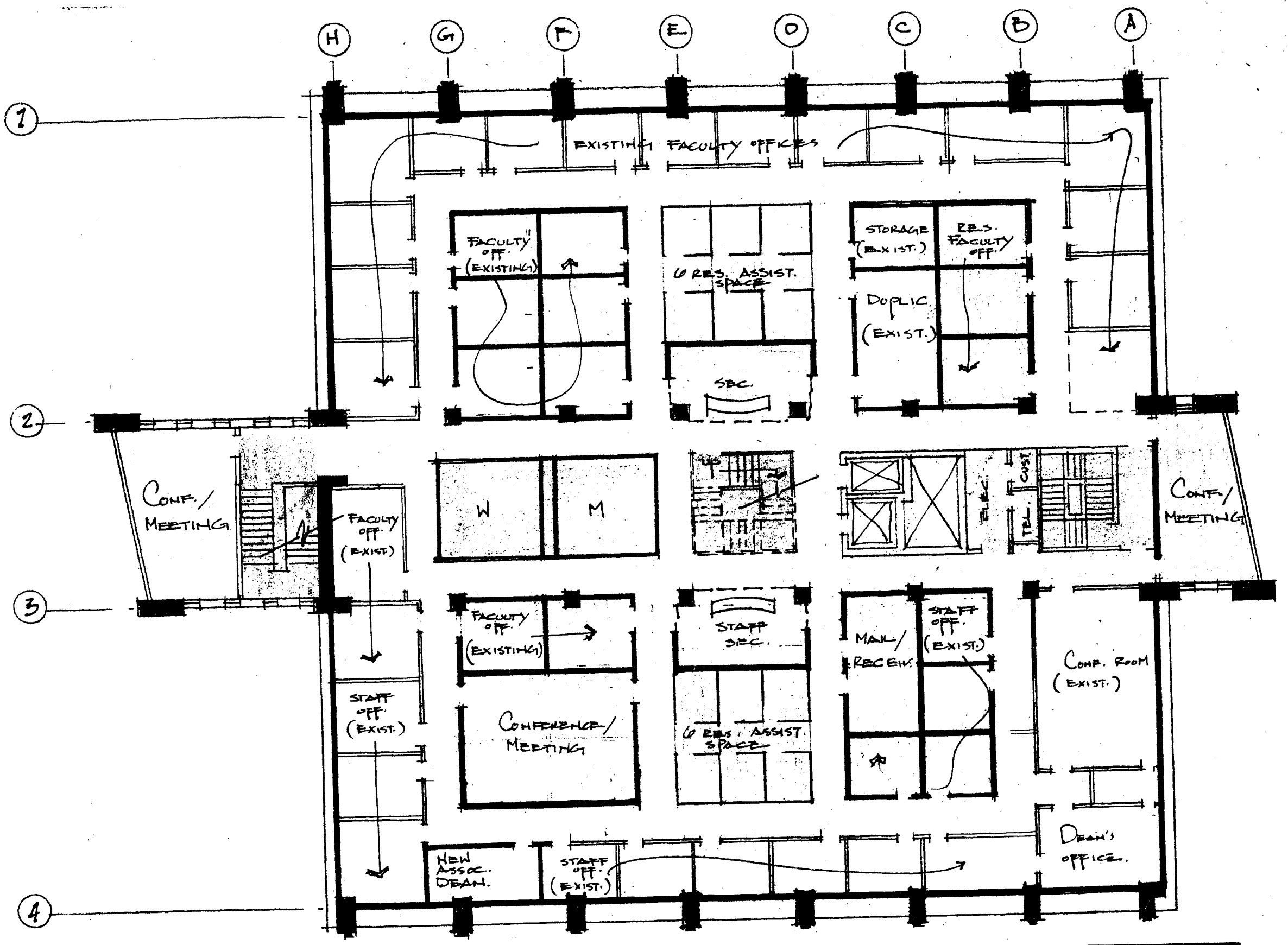
College of Nursing Master Plan - Figure 19

Preferred Option - Level Three Plan

July 2005

0' 4' 8' 16'

ajc architects



THE UNIVERSITY OF UTAH

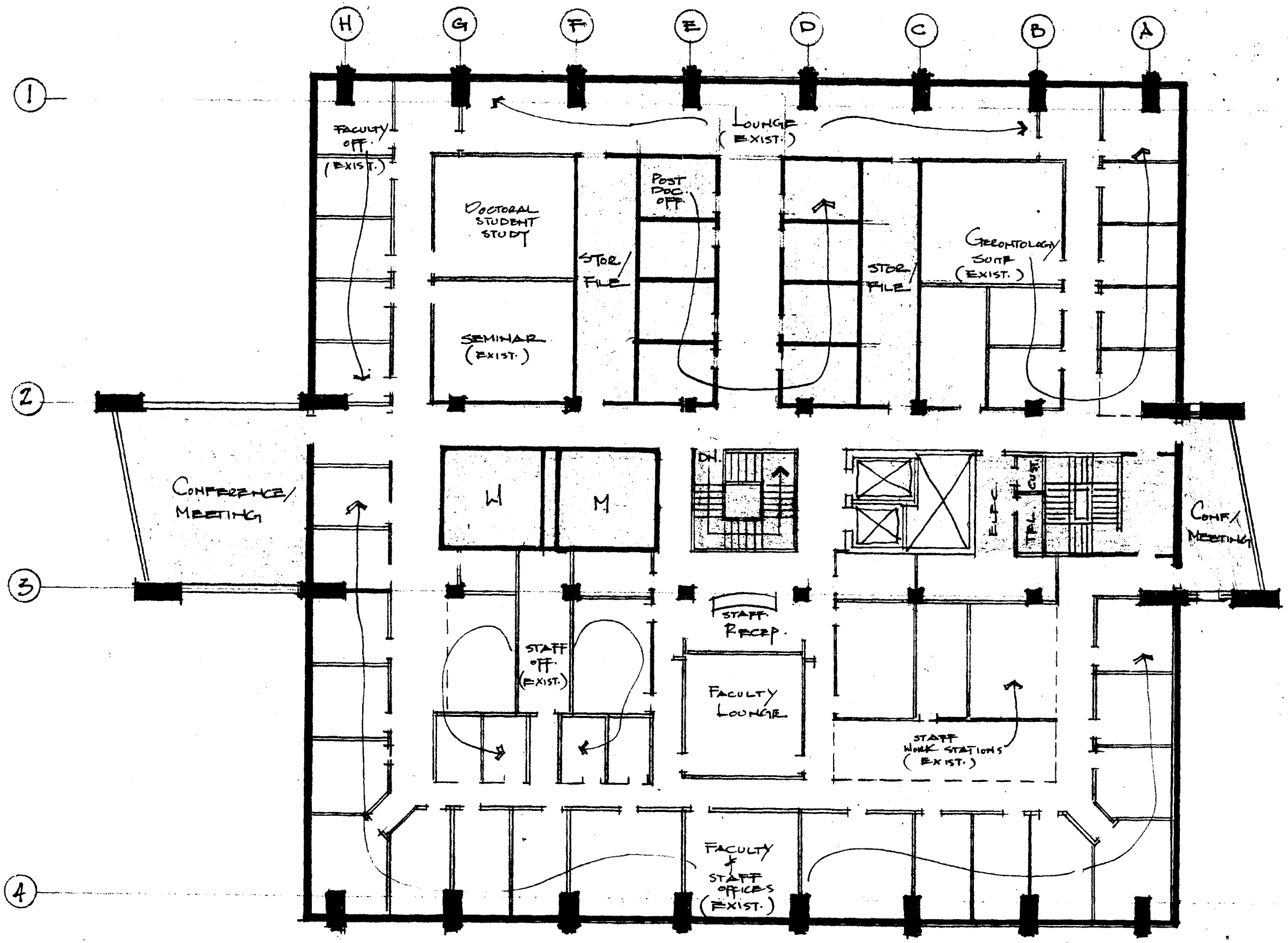
College of Nursing Master Plan - Figure 20

Preferred Option - Level Four Plan

July 2005

0' 4' 8' 16'

ajc architects



THE UNIVERSITY OF UTAH

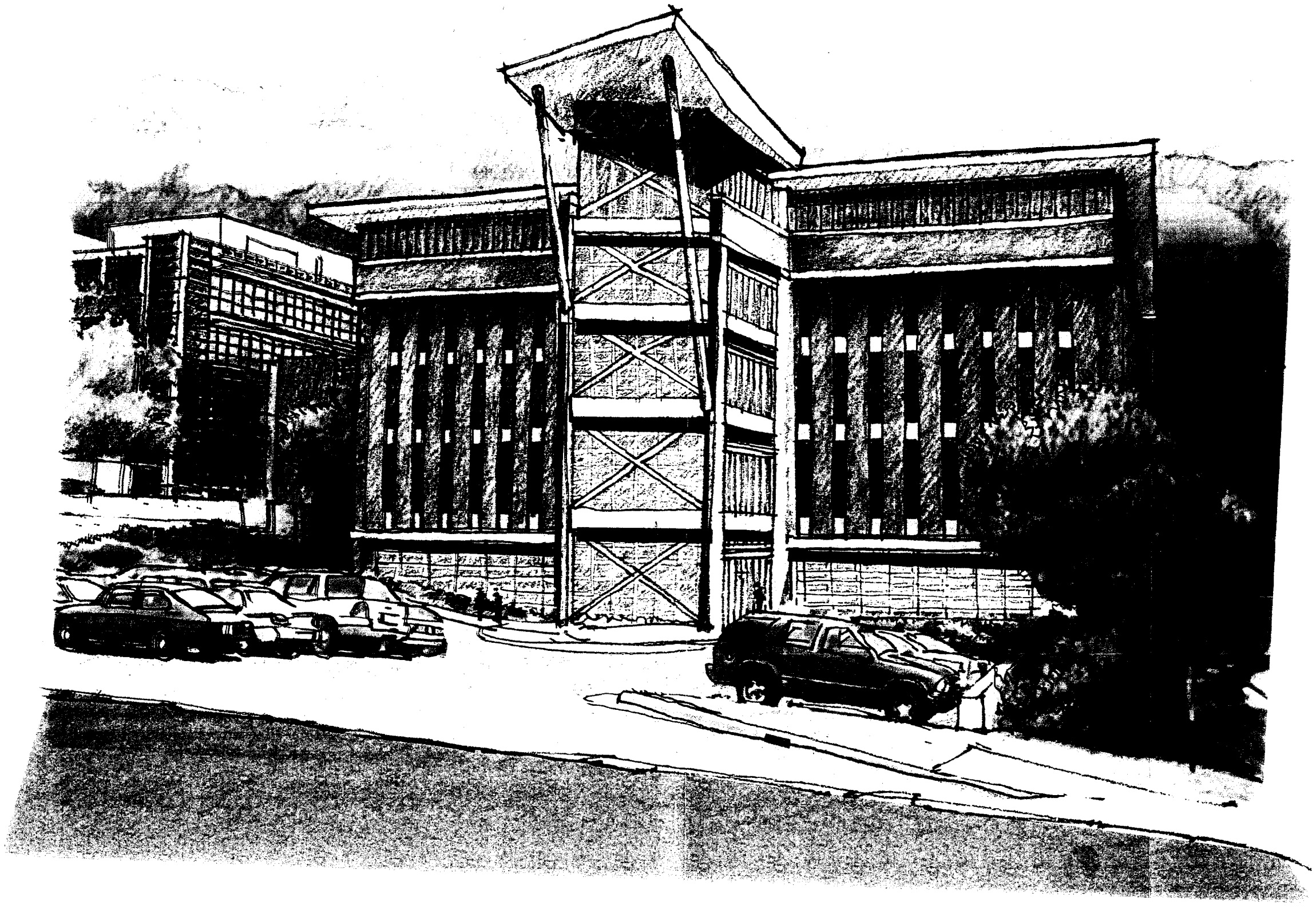
College of Nursing Master Plan - Figure 21

Preferred Option - Level Five Plan

July 2005

0 4' 8' 16'

ajc architects



THE UNIVERSITY OF UTAH

College of Nursing Master Plan - Figure 22

Concept Rendering

July 2005

ajc architects

STRUCTURAL
PREFERRED OPTIONS AND RECOMMENDATIONS

Schematic retrofit approaches have been developed for each of the deficiencies. Retrofit schemes have been developed based upon knowledge of existing deficiencies and engineering judgment.

There are several items that need to be upgraded to bring the College of Nursing Buildings into compliance with the requirements set forth by ASCE/SEI 31-03. The following are our recommendations for upgrading the structures:

1) **New Concrete Shear Wall at the North of the Building.** Adding new concrete shear wall at the north will significantly reduce the shear in the existing masonry and concrete shear wall. It also eliminates the torsion problem in the building.
2) **New Steel Braced Frames at the East and West of the Building.** Adding a new concrete shear wall at the north of the building does improve the performance of the building to resist the large seismic loads. However, the moment frames in the south-north direction still resist the distributed seismic forces. The strong column and weak beam problem still exists. It is very expensive to strengthen each column along the east and west side of the building. The new steel braced frames are preferred and recommended to add along the east and west side of the building. It will release almost all the stresses of the moment frame member due to the seismic force. Figure 7 shows the new steel braced frames locations.
3) **Non Structural Elements.** All the connections and bracing for mechanical and electrical system will be expected to be designed to meet the current code requirements during the upgrade of mechanical system. The bracing for ceilings, lights, and partition walls will be expected to be designed for current code during the interior remodel.

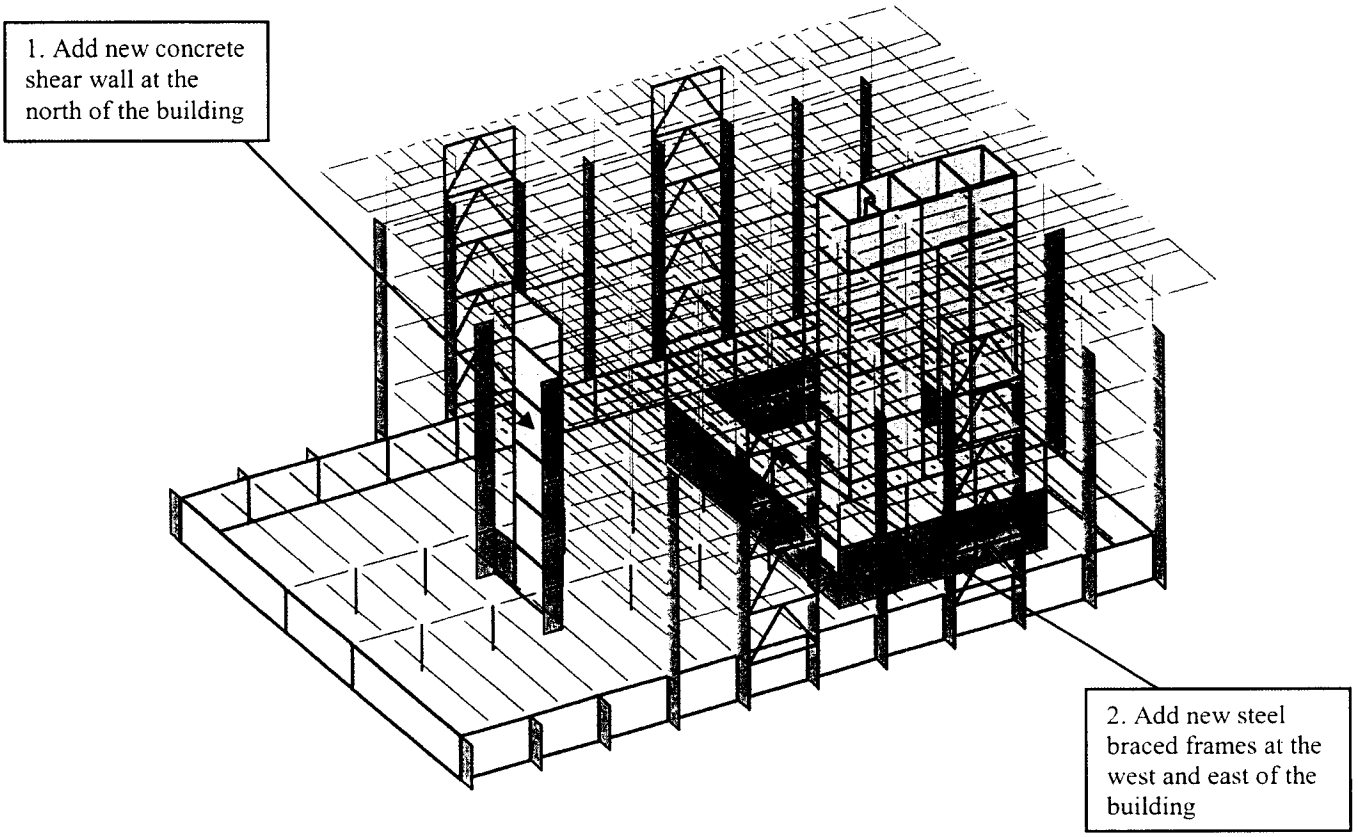


Figure 7 Seismic Upgrade based on Preferred Option

WHW ENGINEERING INC.
CONSULTING
MECHANICAL
ENGINEERS

U of U College of Nursing Master Plan
Preferred Mechanical Option

The constraints of retrofit projects make it impossible to rectify all substandard situations, but there are major areas of concern that should be addressed. It appears that in spite of multiple interior upgrades, the existing mechanical systems are almost entirely the original systems that were installed in 1967, with the exception of the recent work done on the 5th floor. Nearly all of the equipment is in poor condition, and significantly beyond its recommended service life.

The building is in desperate need of a major mechanical retrofit. Most of the mechanical system should be replaced. There are multiple options for correcting and replacing these systems. The following are the preferred mechanical and plumbing replacement requirements. These items address life safety, code violations, equipment age, energy conservation, future equipment failures, and the owner's and occupant's needs and requirements.

A. PLUMBING RECOMMENDATIONS

1. Replace the existing galvanized domestic water piping with new copper piping.
2. Replace the existing domestic water heater and storage tank, including hot water recirculating pump.
3. Replace existing water PRV station.
4. Replace existing duplex sump pump.
5. Replace fixtures as necessary.

B. HVAC COMMON RECOMMENDATIONS

1. Replace the existing chiller with a new 300 ton (approx.) chiller, and associated chilled water piping, pumps, etc.
2. Replace the existing cooling tower and associated condenser water piping, specialties, pumps, etc.
3. Replace the existing high temperature water convertor with a new 6,000 MBH (approx.) shell and tube convertor and associated hot water piping, specialties, pumps, etc.
4. Replace existing pneumatic control system with a DDC system and integrate into the campus head end.
5. Replace existing low pressure ductwork and associated registers, grilles, diffusers, etc.
6. Replace existing exhaust fans and associated ductwork, grilles, etc.

C. PREFERRED REPLACEMENT OPTION: DUAL DUCT VAV SYSTEM

1. The advantages of using a dual duct VAV system in this building are as follows:
   a. Minimize down time and occupant displacement. Because the

current system is a dual duct system, this could be done one piece at a time as funds and other conditions allow.

b. Individual temperature control can still be achieved by re-doing the medium and low pressure ductwork zoning. This was already done on the fifth floor west side, and would not need to be re-done in that area. Only the controls in that area would need to be replaced.

c. Cost. Because it is the same system, some equipment and ductwork that has already been replaced (such as the 5th floor), or that is still in good condition would be able to remain.

2. The disadvantages of using a dual duct system in this building are as follows:

a. Precise temperature control. Typically, a dual duct system does not consistently give as precise temperature control as a VAV system with reheat.

b. Maintenance. A dual duct system is always heating and cooling simultaneously. This does not allow as much natural downtime for maintenance and repair.

c. Flexibility. A dual duct system is not quite as flexible at accommodating renovations as a traditional VAV with reheat system.

SPECTRUM
ENGINEERS

Memorandum

To:	Jill Jones	**Telephone:**	(801) 466-8818
Company:	AJC Architects	**Fax:**	(801) 466-4411
	703 East 1700 South		
	Salt Lake City, Utah 84105	**Copies to:**	
From:	Dave Wesemann	**Telephone:**	801-401-8468
Job:	College or Nursing Masterplan	**Toll Free:**	800-678-7077
Re:	Electrical Recommendations	**Fax:**	801-401-9468
Job Number:	20040850.dew	**E-mail:**	dew@spectrum-engineers.com
Date:	July 13, 2005	**Page:**	1 of 3

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The recommendations for the electrical systems for the U of U College of Nursing Building are as follows:

SITE UTILITIES

Medium Voltage

Abandon the old 7,200 Volt service to the building and provide new 12,470V service from the adjacent duct bank that was recently installed from the Red Butte substation to the Health Science Education building located southeast of the Nursing Building. Having the new 12,470V distribution so closely available to the building provides a good opportunity to make the conversion without a lot of additional effort. Provide new transformers VFI switch in a new transformer vault for the Nursing Building.

Telecommunications

Provide new (4) 4" duct bank into the building from a manhole located to the northeast of the building. The existing 2" conduit duct bank can be left in place and used to the extent possible.

BUILDING SERVICE AND DISTRIBUTION

Main Service

Replace the main 120/208V service and switchboard with new. This building is rather large for a 120/208V system (not having 277/480V). During the programming and design phase, an evaluation should be made to determine if it would be more cost effective and efficient to change to a 277/480V system. This would depend primarily on the extent of the mechanical system changes and should be considered as part of the overall systems' scheme.

Distribution

New, larger electrical rooms on each floor are recommended containing all new panels and distribution. Ample panelboard space should be provided to accommodate the power needs of a modern office and educational environment.

Outlets and Branch Wiring

New outlets and branch wiring are required throughout the building to meet the demands of the modern, high-technology educational and office environment. Power receptacles should be readily available throughout all classroom and common areas for student and faculty lap top computers.

Emergency Service and Distribution:

Provide a new diesel emergency/stand-by generator system. It shall be sized to meet current life safety and building code emergency loads, including the elevators. Whether the generator is located in a larger room in the lower parking level, or outside in a separate enclosure, will need to be evaluated during the programming and design phases of the project.

LIGHTING

Interior Lighting

A general lighting upgrade with new fixtures and energy-efficient lamps and ballasts is recommended for energy efficiency and to improve the overall quality and functionality of the lighting. In some areas of the building that have been recently upgraded, the existing T8 lamps and electronics ballasts may remain unless extensive new remodeling dictates their replacement.

Newer energy codes require the use of automatic controls throughout the building. Lighting controls inside of classrooms can be enhanced by using programmable dimming/control systems that can be interfaced to new audio/visual controls. Corridors and common areas should be controlled through a lighting relay system that is controlled based on occupancy of the building.

New LED type exit signs are recommended and additional emergency lights are required throughout to meet minimum code levels for egress illumination.

Parking, Pedestrian, and Street Lighting

The building is surrounded by the old campus standard light pole, which is a clear globe on a 10' pole. In another project, many of these fixtures are being replaced by a new light pole standard that was selected for the medical (east) campus area. It is a cut-off fixture with higher performing optics. Any remaining poles that have not been replaced should be replaced as part of the Nursing Building master plan. All

new exterior lighting should be cut-off type and spaced to maintain the minimum, safe lighting levels that are standard for the campus.

FIRE ALARM

Building Fire Alarm System

The original fire alarm system is currently being replaced and upgraded in a separate project. New detectors, audible/visual alarms and wiring are being provided throughout. The audible devices are horns, which would have to be changed out to voice evacuation per the International Codes if an atrium is to be added to the building, or if the assemble occupancy of the building requires it. Being new, this system will remain in place to the extent possible and be modified / expanded as needed for the new work of the Master Plan. All new work shall comply with Campus and State Fire Marshal Rules and Regulations. Only fire alarm systems from Nelson Fire are allowed on campus.

TECHNOLOGY SYSTEMS

Telecommunications

New, stacked telecommunications closets are recommended, sized to meet the current standards. Some cable tray exists in the building. Distribution and support of new cables has been difficult due to the presence of asbestos. As part of the new plan, all new cable trays and empty raceways are needed. The Campus Netcom will provide all the cabling and terminations. All new cabling will be provided to meet the latest standards for high-speed data communications. Wireless networking capabilities will also be provided in the building.

Clock System

Any new work in remodeled or new buildings should use the new campus clock standard, which is battery operated clocks that are synchronized via a wireless satellite signal.

Security

New card readers and CCTV cameras will be needed. The locations of the security devices shall be coordinated with the Campus and user groups during the programming and design phases. There is also an older style emergency telephone in the parking area that should be replaced with the new campus-standard style.

Audio/Visual

All new instructional and meeting spaces in the Master Plan should be considered for a full compliment of audio/visual devices and control systems. Electronic systems for distance education access will also be an important part of the functionality of the building.

Proposed basic project phasing is as follows:

phase 1:

Floors 1 & 2 including new central stair, mechanical and electrical service and equipment upgrades, associated utility and site work.

For cost estimating purposes (inflation), it was assumed that this phase would be publicly bid in year 2007.

other phases:

Floors 3-5, conversion of existing central stair to mens' rest rooms, north and south additions, landscaping and site work.

For cost estimating purposes (inflation), it was assumed that this phase would be publicly bid in year 2010.

Unless stacked electrical & telecommunication costs are provided, phasing should occur from bottom up. See electrical report for more detailed information.

costs:

Order of magnitude cost estimates are provided on the following pages. The first page is a master plan summary sheet showing the budget costs for a menu of components, next is a summary sheet for phase 2. A detail sheet for each listed component follows.

Mechanical and electrical upgrades require an initial investment for equipment and service. These are briefly described in the paragraphs on the bottom of the phase 1 summary sheet and should be included in first phase budget numbers. More detailed information is provided by the engineers at the end of this section.

Also included is more detailed cost estimating information from the structural, mechanical, and electrical consultants.

The following are anticipated to be purchased through the University of Utah under a separate contract: asbestos abatement, lock cylinders & keying, signage.

A list of items considered to be "soft costs" follows: architectural services, furnishings, equipment, IT equipment, project management, donor recognition, U of U campus orders and utility shut-downs, telecommunications fiber and copper, moving costs, material testing, inspections and construction contingency.

MASTER PLAN SUMMARY

Cost Estimates do NOT include: Furnishings, AV Equipment, Asbestos Abatement, unless noted otherwise. Estimated abatement costs are provided in Wilson Consulting Services Letter Dated April 7, 2004 included in the appendix.

	Construction Costs	Soft Costs	Total Project Costs
New Addition to Building- North Stair Tower PH 2 (FY2010)	$1,137,955	$250,350	$1,388,305
New Addition to Building- South Tower PH 2 (FY2010)	$461,160	$101,455	$562,615
Level 1 Improvements PH 1 (FY2007)	$3,282,880	$722,234	$4,005,114
LR&SC AV & Simulation Equip. Costs PH 1 (FY2007)	$0	$1,481,320	$1,481,320
Level 2 Improvements PH 1 (FY2007)	$1,481,303	$325,887	$1,807,189
Level 3 Improvements PH 2 (FY2010)	$2,731,230	$600,871	$3,332,101
Level 4 Improvements PH 2 (FY2010)	$2,665,934	$586,505	$3,252,439
Level 5 Improvements PH 2 (FY2010)	$1,080,206	$237,645	$1,317,851
Mechanical Equip Replacement & Upgrade PH 1 (FY2007)	$919,880	$202,374	$1,122,254
Electrical Service System Upgrade PH 1 (FY2007)	$566,080	$124,538	$690,618
TOTALS	***$14,326,628***	***$4,633,178***	***$18,959,806***

PHASE 1 SUMMARY

Cost Estimates do NOT include: Furnishings, AV Equipment, Asbestos Abatement, unless noted otherwise. Estimated abatement costs are provided in Wilson Consulting Services Letter Dated April 7, 2004 included in the appendix.

	Construction Costs	Soft Costs	Total Project Costs
Level 1 Improvements PH 1 (FY2007)	$3,282,880	$722,234	$4,005,114
LR&SC AV and Simulation Equip. Costs PH 1 (FY2007)	$0	$1,481,320	$1,481,320
Level 2 Improvements PH 1 (FY2007)	$1,481,303	$325,887	$1,807,189
Mechanical Equip Replacement and Upgrade* PH 1 (FY2007)	$919,880	$202,374	$1,122,254
Electrical Service System Upgrade** PH 1 (FY2007)	$566,080	$124,538	$690,618
	$6,250,143	***$2,856,351***	***$9,106,495***

* This includes the following: Replace the existing chiller, cooling tower, heat exchanger, hot water pumps, chilled water pumps, condenser water pumps, dual duct air handler, and provide a new building management system. These items would not be directly tied to any single space, but will have an effect on every space. The approximate mechanical costs to upgrade these components of the main building mechanical system would be approximately $650,000. (FY 2005 dollars). Refer to mechanical upgrade detail sheet (7.5.8), mechanical report and cost estimate for more detail.

** This includes the following: New medium voltage distribution, new telecommunications duct bank, upgrade to core building electrical, new generator and emergency distribution system. The approximate costs to upgrade these components of the main building electrical system would be approximately $400,000. (FY 2005 dollars). Refer to electrical upgrade detail sheet (7.5.9), electrical cost estimate and report for more detail.

PHASE 2* SUMMARY

Cost Estimates do NOT include: Furnishings, AV Equipment, Asbestos Abatement, unless noted otherwise. Estimated abatement costs are provided in Wilson Consulting Services Letter Dated April 7, 2004 included in the appendix.

	Construction Costs	Soft Costs	Total Project Costs
New Addition to Building-North Stair Tower PH 2 (FY2010)	$1,137,955	$250,350	$1,388,305
New Addition to Building-South Tower PH 2 (FY2010)	$461,160	$101,455	$562,615
Level 3 Improvements PH 2 (FY2010)	$2,731,230	$600,871	$3,332,101
Level 4 Improvements PH 2 (FY2010)	$2,665,934	$586,505	$3,252,439
Level 5 Improvements PH 2 (FY2010)	$1,080,206	$237,645	$1,317,851
	$8,076,485	***$1,776,827***	***$9,853,312***

* Logistically it is possible to separate phase 2 into several phases.

DETAIL SHEET

Cost Estimates do NOT include: Furnishings, AV Equipment, Asbestos Abatement, unless noted otherwise. Estimated abatement costs are provided in Wilson Consulting Services Letter Dated April 7, 2004 included in the appendix.

description	quantity	unit	$/unit	extended $
New Addition to Building -- North Stair Tower	**4,750**	**SF**		
Level 1	950	SF	$135.00	$128,250
Level 2	950	SF	$135.00	$128,250
Level 3	950	SF	$135.00	$128,250
Level 4	950	SF	$135.00	$128,250
Level 5	950	SF	$135.00	$128,250
Miscellaneous Site(Including west side)	1	LS	$25,000.00	$25,000
			Sub Total	*$666,250*
General Conditions			6%	$39,975
Overhead and Profit			6%	$39,975
Design Contingency			10%	$66,625
			Sub Total	***$812,825***
Inflated to 2010 (5 years at 8% per year)			40%	$325,130
			Sub Total Construction Costs	***$1,137,955***
Soft Costs			22%	$250,350
			Total Project Costs	***$1,388,305***

DETAIL SHEET

Cost Estimates do NOT include: Furnishings, AV Equipment, Asbestos Abatement, unless noted otherwise. Estimated abatement costs are provided in Wilson Consulting Services Letter Dated April 7, 2004 included in the appendix.

description	quantity	unit	$/unit	extended $
New Addition to Building -- South Tower	**2000**	**SF**		
Level 1	400	SF	$135.00	$54,000
Level 2	400	SF	$135.00	$54,000
Level 3	400	SF	$135.00	$54,000
Level 4	400	SF	$135.00	$54,000
Level 5	400	SF	$135.00	$54,000
Miscellaneous Site	1	LS	$25,000.00	$25,000
			Sub Total	*$270,000*
General Conditions			6%	$16,200
Overhead and Profit			6%	$16,200
Design Contingency			10%	$27,000
			Sub Total	***$329,400***
Inflated to 2010 (5 years at 8% per year)			40%	$131,760
			Sub Total Construction Costs	***$461,160***
Soft Costs			22%	$101,455
			Total Project Costs	***$562,615***

DETAIL SHEET

Cost Estimates do NOT include: Furnishings, AV Equipment, Asbestos Abatement, unless noted otherwise. Estimated abatement costs are provided in Wilson Consulting Services Letter Dated April 7, 2004 included in the appendix.

description	quantity	unit	$/unit	extended $
Level 1 Improvements	17,124	SF		
Level 1 Infill Area Shell Only	9,600	SF	$60.00	$576,000
Level 1 Substantial Interior Renovation to New Infill & Exist.				
Demolition	7,524	SF	$0.75	$5,643
Architectural	17,124	SF	$40.00	$684,960
Mechanical	17,124	SF	$22.00	$376,728
Electrical	17,124	SF	$21.00	$359,604
Structural-Seismic	17,124	SF	$17.25	$295,389
Fire Sprinkler	17,124	SF	$1.25	$21,405
			Sub Total	*$2,319,729*
General Conditions			6%	$139,184
Overhead and Profit			6%	$139,184
Design Contingency			10%	$231,973
			Sub Total	***$2,830,069***
Inflated to 2007 (2 years at 8% per year)			16%	$452,811
			Sub Total Construction Costs	***$3,282,880***
Soft Costs			22%	$722,234
			Total Project Costs	***$4,005,114***
Additional Soft Costs for Learning Resource Center				
A/V Systems and Equipment				$277,000
Simulation and Lab Equipment				$1,000,000
			Sub Total Additional Soft Costs	***$1,277,000***
Inflated to 2007 (2 years at 8% per year)			16%	$204,320
			Total Additional Soft Costs	***$1,481,320***
			Total Project Costs	***$5,486,434***

DETAIL SHEET

Cost Estimates do NOT include: Furnishings, AV Equipment, Asbestos Abatement, unless noted otherwise. Estimated abatement costs are provided in Wilson Consulting Services Letter Dated April 7, 2004 included in the appendix.

description	quantity	unit	$/unit	extended $
Level 2 Improvements	**8,454**	**SF**		
Level 2 New Classrooms 5,800 SF	Separate Project Costs Not Included			
Level 2 Auditorium 2,900 SF	No Renovation Required			
Level 2 Substantial Interior Renovation to Existing Space				
Demolition	8,454	SF	$0.75	$6,341
Architectural	8,454	SF	$35.00	$295,890
Mechanical	8,454	SF	$22.00	$185,988
Electrical	8,454	SF	$21.00	$177,534
Structural-Seismic	17,124	SF	$17.25	$295,389
Fire Sprinkler	8,454	SF	$1.25	$10,568
New Stairs to Level 3	1	LS	$75,000.00	$75,000
			Sub Total	*$1,046,709*
General Conditions			6%	$62,803
Overhead and Profit			6%	$62,803
Design Contingency			10%	$104,671
			Sub Total	***$1,276,985***
Inflated to 2007 (2 years at 8% per year)			16%	$204,318
			Sub Total Construction Costs	***$1,481,303***
Soft Costs			22%	$325,887
			Total Project Costs	***$1,807,189***

DETAIL SHEET

Cost Estimates do NOT include: Furnishings, AV Equipment, Asbestos Abatement, unless noted otherwise. Estimated abatement costs are provided in Wilson Consulting Services Letter Dated April 7, 2004 included in the appendix.

description	quantity	unit	$/unit	extended $
Level 3 Improvements	**17,124**	**SF**		
Level 3 Substantial Interior Renovation to Existing Space				
Demolition	15,026	SF	$0.75	$11,270
Architectural	15,026	SF	$35.00	$525,910
Mechanical	15,026	SF	$22.00	$330,572
Electrical	15,026	SF	$21.00	$315,546
Structural-Seismic	17,124	SF	$17.25	$295,389
Fire Sprinkler	15,026	SF	$1.25	$18,783
Level 3 Minor Interior Renovation to Existing Space				
Demolition	2,128	SF	$0.50	$1,064
Architectural	2,128	SF	$20.00	$42,560
Mechanical	2,128	SF	$12.00	$25,536
Electrical	2,128	SF	$14.00	$29,792
Fire Sprinkler	2,128	SF	$1.25	$2,660
			Sub Total	*$1,599,081*
General Conditions			6%	$95,945
Overhead and Profit			6%	$95,945
Design Contingency			10%	$159,908
			Sub Total	***$1,950,879***
Inflated to 2010 (5 years at 8% per year)			40%	$780,352
			Sub Total Construction Costs	***$2,731,230***
Soft Costs			22%	$600,871
			Total Project Costs	***$3,332,101***

DETAIL SHEET

Cost Estimates do NOT include: Furnishings, AV Equipment, Asbestos Abatement, unless noted otherwise. Estimated abatement costs are provided in Wilson Consulting Services Letter Dated April 7, 2004 included in the appendix.

description	quantity	unit	$/unit	extended $
Level 4 Improvements	**17,124**			
Level 4 Substantial Interior Renovation to Existing Space				
Demolition	11,515	SF	$0.75	$8,636
Architectural	11,515	SF	$35.00	$403,025
Mechanical	11,515	SF	$22.00	$253,330
Electrical	11,515	SF	$21.00	$241,815
Structural-Seismic	17,124	SF	$17.25	$295,389
Fire Sprinkler	11,515	SF	$1.25	$14,394
New Stairs to Level 5	1	LS	$75,000.00	$75,000
Level 4 Minor Interior Renovation to Existing Space				
Demolition	5,639	SF	$0.50	$2,820
Architectural	5,639	SF	$20.00	$112,780
Mechanical	5,639	SF	$12.00	$67,668
Electrical	5,639	SF	$14.00	$78,946
Fire Sprinkler	5,639	SF	$1.25	$7,049
			Sub Total	*$1,560,851*
General Conditions			6%	$93,651
Overhead and Profit			6%	$93,651
Design Contingency			10%	$156,085
			Sub Total	***$1,904,239***
Inflated to 2010 (5 years at 8% per year)			40%	$761,695
			Sub Total Construction Costs	***$2,665,934***
Soft Costs			22%	$586,505
			Total Project Costs	***$3,252,439***

DETAIL SHEET

Cost Estimates do NOT include: Furnishings, AV Equipment, Asbestos Abatement, unless noted otherwise. Estimated abatement costs are provided in Wilson Consulting Services Letter Dated April 7, 2004 included in the appendix.

description	quantity	unit	$/unit	extended $
Level 5 Improvements	**4,280**	**SF**		
Level 5 Substantial Interior Renovation to Existing Space				
Demolition	4,280	SF	$0.75	$3,210
Architectural	4,280	SF	$35.00	$149,800
Mechanical	4,280	SF	$22.00	$94,160
Electrical	4,280	SF	$21.00	$89,880
Structural-Seismic	17,124	SF	$17.25	$295,389
Fire Sprinkler	4,280	SF	$1.25	$5,350
			Sub Total	*$632,439*
General Conditions			6%	$37,946
Overhead and Profit			6%	$37,946
Design Contingency			10%	$63,244
			Sub Total	***$771,576***
Inflated to 2010 (5 years at 8% per year)			40%	$308,630
			Sub Total Construction Costs	***$1,080,206***
Soft Costs			22%	$237,645
			Total Project Costs	***$1,317,851***

DETAIL SHEET

Cost Estimates do NOT include: Furnishings, AV Equipment, Asbestos Abatement, unless noted otherwise. Estimated abatement costs are provided in Wilson Consulting Services Letter Dated April 7, 2004 included in the appendix.

description	quantity	unit	$/unit	extended $
Mechanical Upgrade				**$650,000**
General Conditions			6%	$39,000
Overhead and Profit			6%	$39,000
Design Contingency			10%	$65,000
			Sub Total	***$793,000***
Inflated to 2007 (2 years at 8% per year)			16%	$126,880
			Sub Total Construction Costs	***$919,880***
Soft Costs			22%	$202,374
			Total Project Costs	***$1,122,254***

DETAIL SHEET

Cost Estimates do NOT include: Furnishings, AV Equipment, Asbestos Abatement, unless noted otherwise. Estimated abatement costs are provided in Wilson Consulting Services Letter Dated April 7, 2004 included in the appendix.

description	quantity	unit	$/unit	extended $
Electrical Upgrade				**$400,000**
General Conditions			6%	$24,000
Overhead and Profit			6%	$24,000
Design Contingency			10%	$40,000
			Sub Total	***$488,000***
Inflated to 2007 (2 years at 8% per year)			16%	$78,080
			Sub Total Construction Costs	***$566,080***
Soft Costs			22%	$124,538
			Total Project Costs	***$690,618***

ESTIMATE OF PROBABLE COST

An estimate of probable costs has been developed for the schematic retrofit approach presented for the building. The cost estimates derived include costs for removing typical architectural finishes, strengthening the structure or foundation, and replacing the architectural finishes. Additional costs have been included to account for areas where the proposed retrofit appears to interfere with known plumbing, electrical, mechanical equipment or special architectural finishes. Costs have not included contractor mobilization, overhead and profit as well as providing some allowances to cover typical design fees, testing and special inspection requirements. The cost estimates shown are costs relative to upgrading the main structural system of the building to meet the basic safety objective of ASCE/SEI 31-03. Costs for bracing secondary elements of the building including architectural ornamentation, signs, mechanical equipment or other non-structural elements have not been included in the cost estimate. Costs have not included the new additions at the south and north entries, architectural interior remodel, and the infill of existing stair.

The following table presents a summary of the expected costs for the upgrade of the structures for the college of nursing building based on the phases.

Structure	**Upgrade Cost Estimate**
Phase I (Seismic upgrade from foundation to 2nd floor)	$590,294.00
Phase II (Seismic upgrade from 2nd floor and above)	$855,371.50
Total Seismic Upgrade Cost Estimate:	$1,445,666.00

Conclusion

The presented upgrade scheme presents an approximate solution in order upgrade the structure to meet the Life Safety Performance Level of ASCE/SEI 31-03. Additional analysis will be required in order to incorporate the upgrade into the architectural floor plan and provide proper sizing and detailing of the structural elements.

R E
& A

The seismic upgrade recommendations are intended to increase the level of life safety to the building occupants. However, many of the existing details of the building still will not meet current code requirements for a new building. This means the earthquake hazard to occupants of the building will be reduced, but not eliminated. The goal of this report is to present a schematic upgrade that will bring the primary structural system to meet the Life Safety Performance Level of ASCE/SEI 31-03. The owner should consider the intended use of the structure to determine if the Life Safety Performance Level meets the owner's upgrade criteria. A similar upgrade approach would be used with a higher seismic performance level (i.e. Immediate Occupancy), however, strengthening measures would be more severe and costs would increase accordingly. Under the Life Safety Performance Level criteria, injuries during the earthquake may occur, but it is expected that the overall risk of life threatening injury will be minimized. The Life Safety Performance Level upgrade criteria are not intended to limit damage to the building. Repair of the structure after a moderate seismic event should be possible, but for economic reasons this may not be practical.

Fan Xiao, P.E.

Jeff Miller, S.E.

R E
& A

WHW ENGINEERING INC.
CONSULTING
MECHANICAL
ENGINEERS

U of U College of Nursing Master Plan
Mechanical Probable Costs

Approximate mechanical and plumbing $/square foot

New Construction: $25/square foot

Infill Construction: $25/square foot

Significant Remodel: $22/square foot

Minor Remodel: $10/square foot

In addition to the space remodels listed above, the existing main mechanical and plumbing systems are in very poor condition and need to be replaced. See the mechanical study for further detail and information. There are multiple options for replacing the mechanical system that will influence to overall cost of the main mechanical systems replacement. The current system is not the best possible system, but if the remodel is done in pieces, the mechanical system will need to be replaced with the same type of system. In summary this will require the following: Replace the existing heat exchanger, hot water pumps, chilled water pumps, dual duct air handler, and provide a new building management system "head end". These items would not be directly tied into any single space, but they will have an effect on every space. The approximate mechanical cost to upgrade these components of the main building mechanical and plumbing systems will be around $650,000.

Please feel free to contact our office with any additional questions.

Sincerely,

Win Packer, P.E.

SPECTRUM
ENGINEERS

Memorandum

To:	Jill Jones	**Telephone:**	(801) 466-8818
Company:	AJC Architects	**Fax:**	(801) 466-4411
	703 East 1700 South		
	Salt Lake City, Utah 84105	**Copies to:**	
From:	Dave Wesemann	**Telephone:**	801-401-8468
Job:	College or Nursing Masterplan	**Toll Free:**	800-678-7077
Re:	Electrical Comments and Costs	**Fax:**	801-401-9468
Job Number:	20040850.dew	**E-mail:**	dew@spectrum-engineers.com
Date:	June 6, 2005	**Page:**	1 of 2

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Jill,

We have reviewed the Architectural sketches for Option A, dated 5/26/05 and have the following comments:

1. The Telephone rooms on each floor will need to be enlarged by about double to accommodate the U of U and EIA/TIA requirements for telecommunications equipment closets. However, the adjacent electrical rooms are slightly larger than needed. Overall, the total space given to electrical and telephone rooms should be adequate to serve both systems, with slight adjustments in wall locations.
2. The Electrical Systems Evaluation Report discusses the need for a new main electrical service, including medium voltage distribution. This will require a new transformer and switch vault, either in the lower parking level or in a new underground vault space adjacent to the building. Costs to construct the new vault need to be included in the cost estimate.
3. The building requires a new diesel emergency generator which will need to be located in a new generator room, possible on the lower parking level, and costs associated with constructing this new room need to be included in the estimate. Alternatively, if an exterior location can be found, the generator could be located outdoors on a concrete pad with screen walls.
4. If the project will be phased, the replacement of the electrical distribution system could be phased as well, with the new main electrical service going in on the first phase, and then replacement of the floor-by-floor distribution occurring as remodeling occurs on a particular floor. However, this

does require that either a) the new core electrical and telephone closets that are stacked be all constructed in the first phase to allow vertical distribution to future phases, or b) the phasing be in sequence by floor, beginning with first floor, then second, and so on. This would allow the vertical distribution to grow vertically in sequence as the phases are completed.

Our opinion of probable cost for the electrical work is as follows:

ITEM / DESCRIPTION	COST
Phase 1	
Site Electrical	
New Medium Voltage Distribution: including duct bank, manhole, 15 kV switch and transformer	$180,000
New Telecommunications Duct Bank	$25,000
Core Building Electrical	
New Building Electrical Service: Main feeders and switchboard only. Distribution elements will be included on floor by floor basis as part of the square foot costs.	$80,000
Mechanical Equipment Connections: Includes electrical distribution necessary to support the mechanical systems replacement.	$45,000
New Generator and Emergency Distribution: Generator, transfer switch, main EM panel.	$65,000
Interior Remodel / Addition Costs (SF Basis)	
New Construction / Addition	$21.00 / s.f.
Infill Construction	$21.00 / s.f.
Significant Remodel	$21.00 / s.f.
Minor Remodel	$14.00 / s.f.
Subsequent Phases	
New Construction / Addition	$21.00 / s.f.
Infill Construction	$21.00 / s.f.
Significant Remodel	$21.00 / s.f.
Minor Remodel	$14.00 / s.f.

Options not selected
- Architectural
- Mechanical

Options Summary

Vision Document Summary

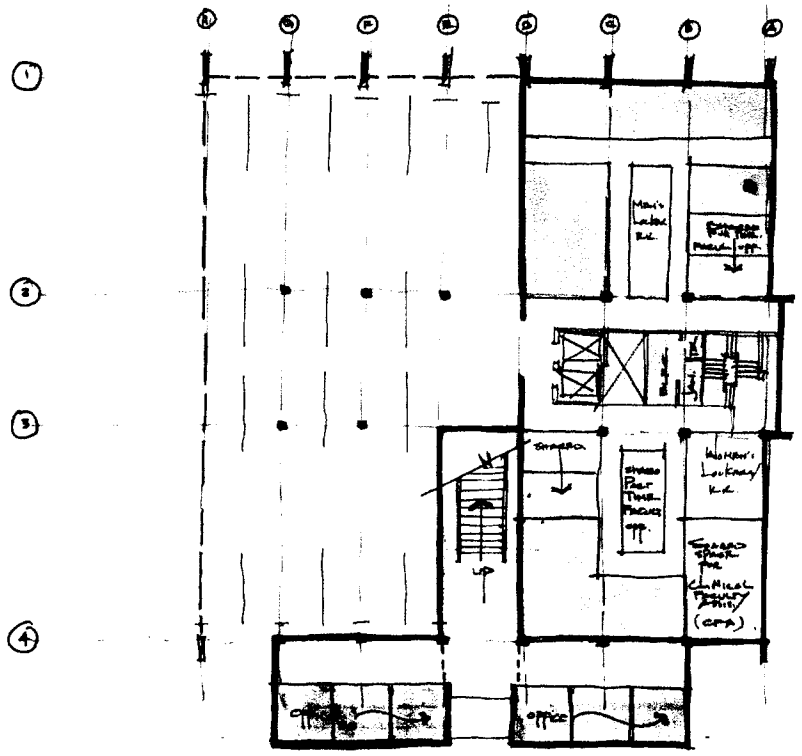
Focus Group Input Summary

Asbestos Abatement

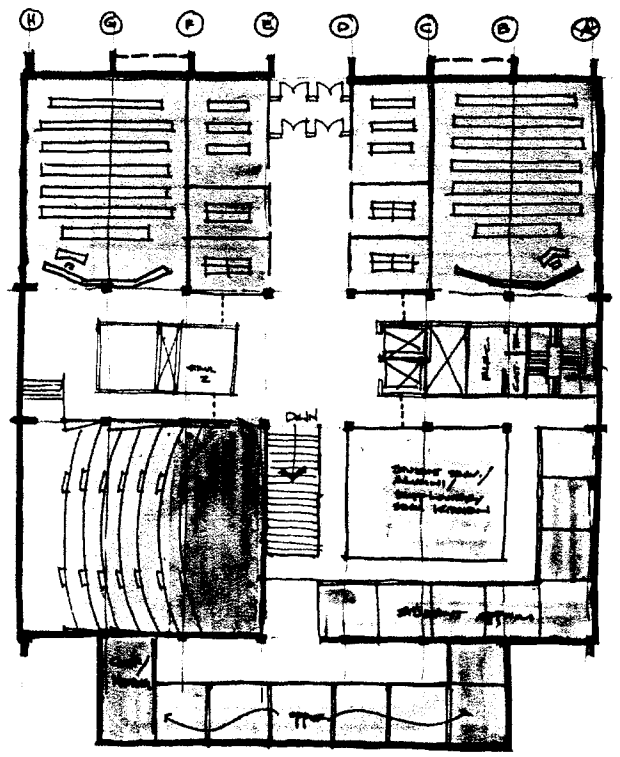
Structural Checklist

UU College of Nursing Master Plan Options Summary

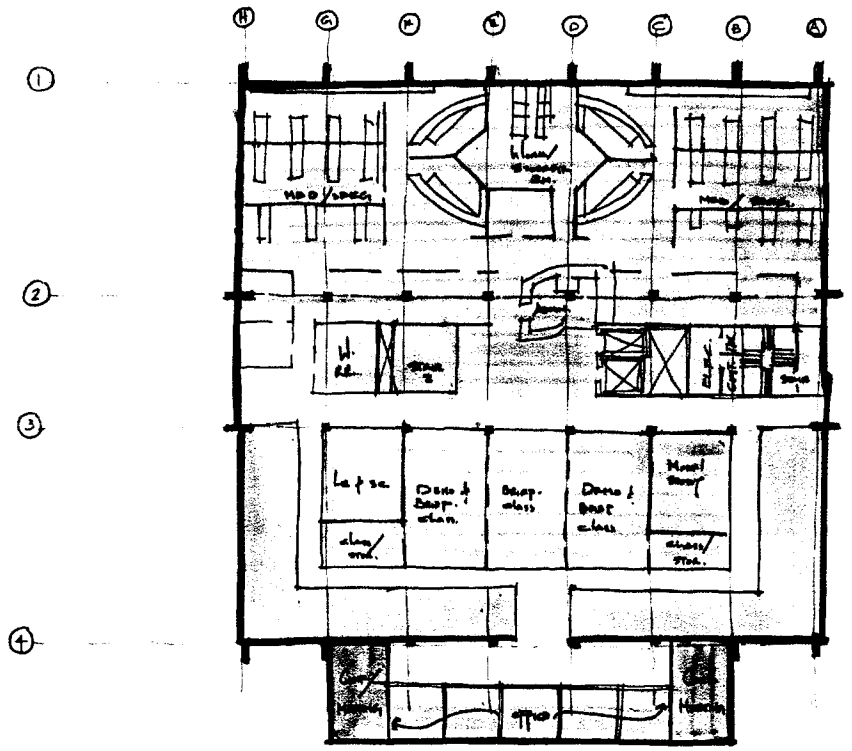
Option	Additional space gained by...	Circulation & Stair	LR&SC Location	Notes
A	Infill of level 1 covered parking along with stair addition at North side	New entrance & exit stair on North side of building replaces central stair levels 1-4. New open & upgrade existing central stair between levels 1-2. Open central stair between levels 4-5.	Level 1	1 Loss of 28 covered parking stalls plus ? additional exterior stalls to accommodate new Level 1 entrance. 2 Good zoning of students on levels 1- 2. Faculty Admin Research levels 3-5. 3
B	Addition at West side of bldng. Levels 1-4.	New entrance at level 1 on West side. Existing stairs to remain in current location and be upgraded.	Level 3	1 Loss of approximately 8 parking stalls. 2 Potential for balcony/garden at 5th floor. 3
C	Addition along North side of building. Primarily at levels 2-4.	New exit stair on North side of bldng replaces central stair levels 1-4. New open central stair between levels 1-2. Open and upgrade stair between levels 4-5.	Level 3	1 Potential for balcony/garden at 5th floor. 2 Loss of approximately 8 parking stalls to accommodate new exit stair at North. 3



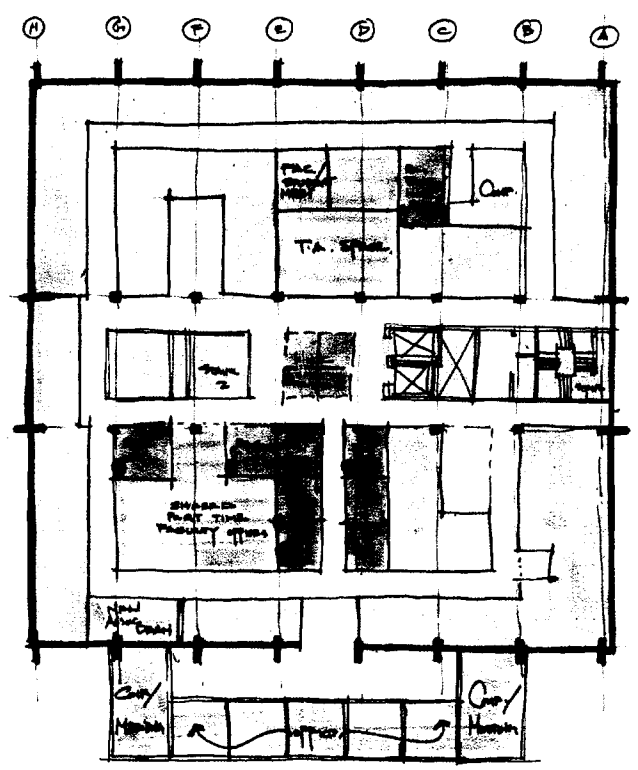
Level One Plan



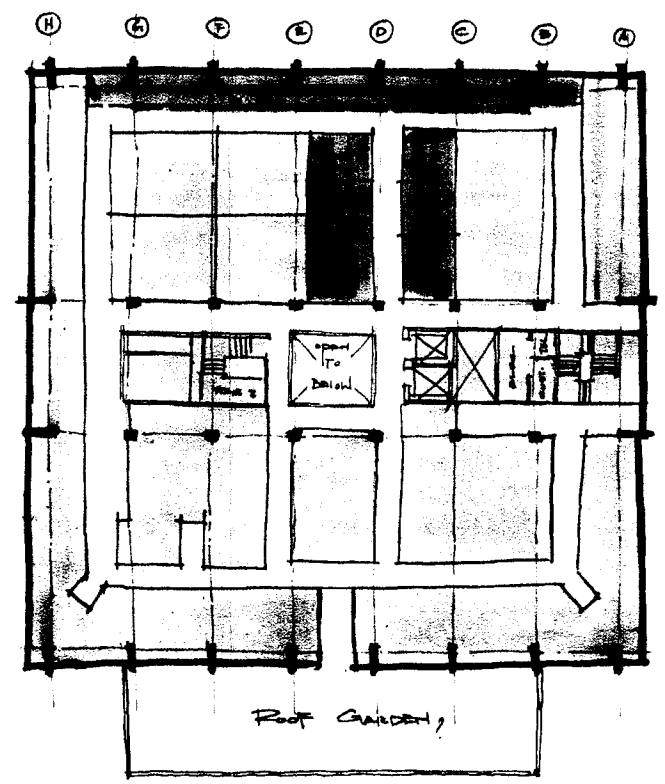
Level Two Plan



Level Three Plan



Level Four Plan



Level Five Plan

THE UNIVERSITY OF UTAH

College of Nursing Master Plan - Figure 23

Option B - Not Selected

June 2005

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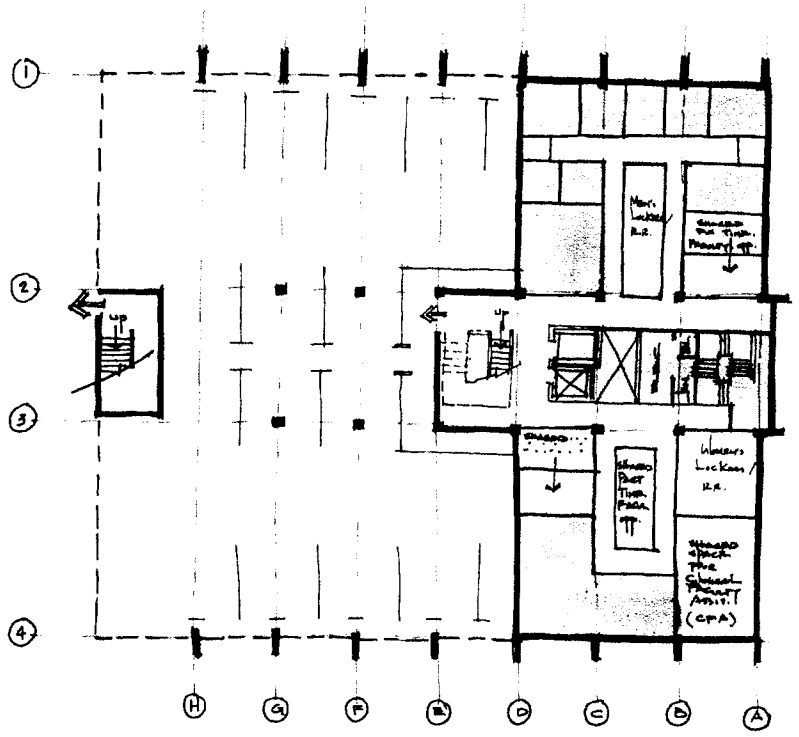
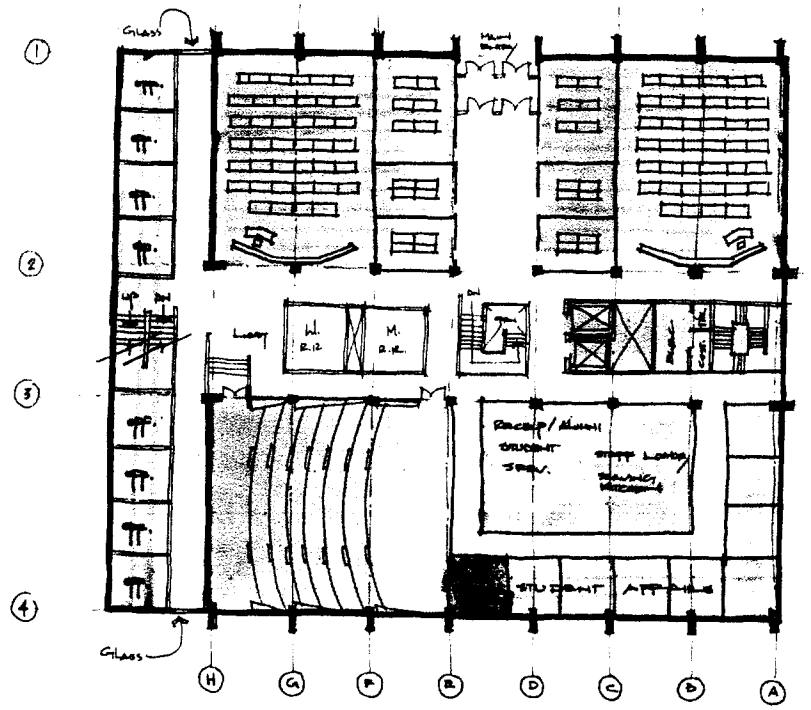


Level One Plan



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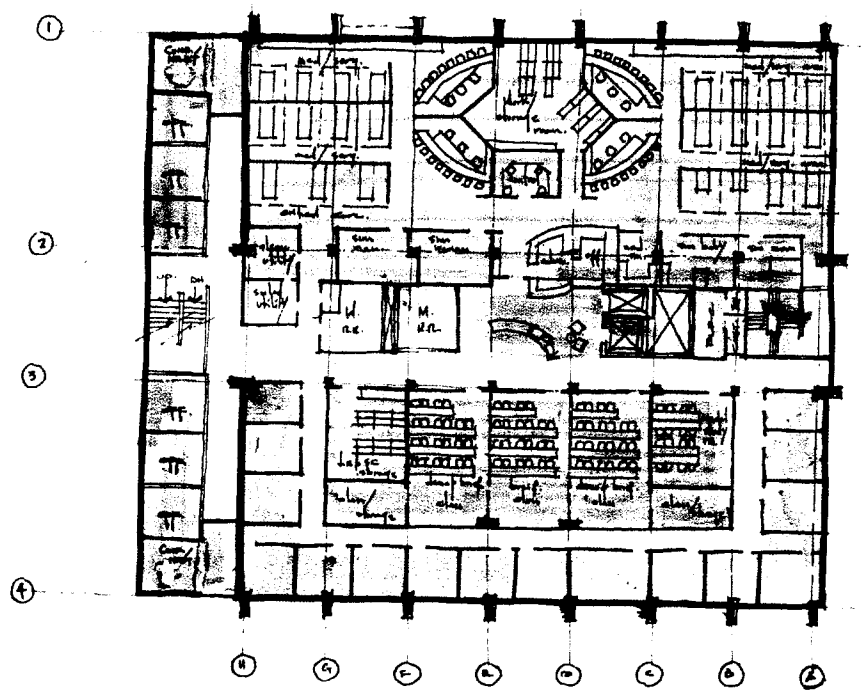

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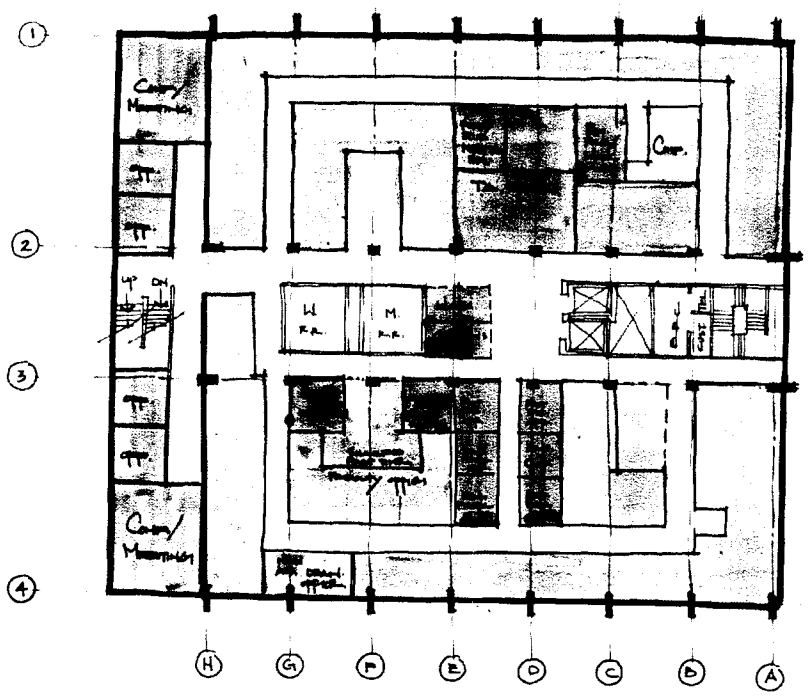
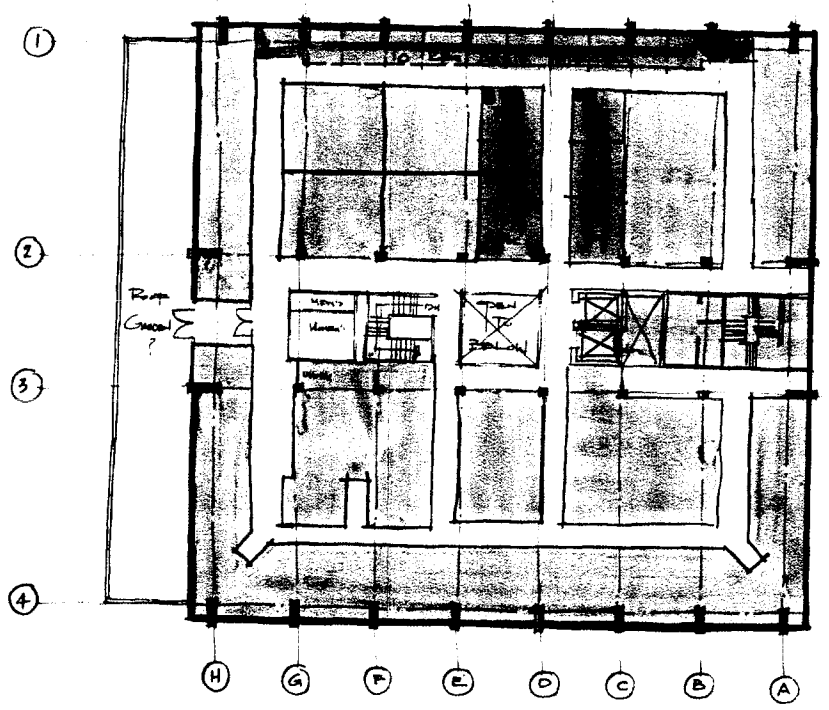


Level Four Plan



Level Five Plan

THE UNIVERSITY OF UTAH

College of Nursing Master Plan - Figure 24

Option C - Not Selected

June 2005

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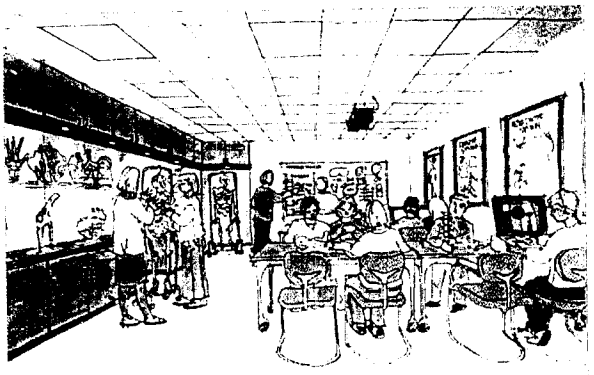
WHW ENGINEERING INC.
CONSULTING
MECHANICAL
ENGINEERS

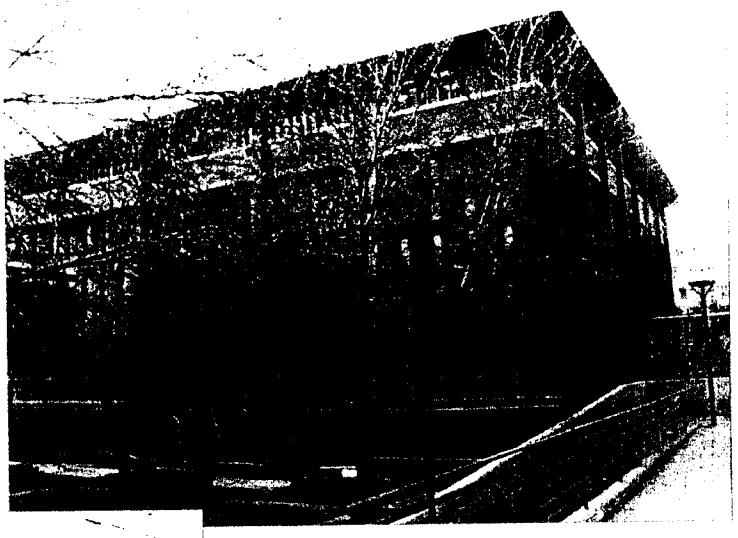
U of U College of Nursing Masterplan
Other Mechanical Options Considered

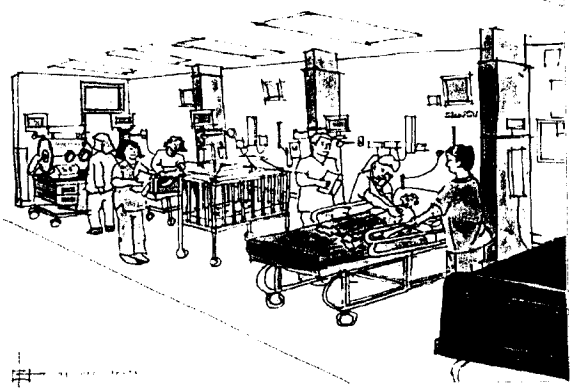
A. SINGLE DUCT VAV WITH REHEAT

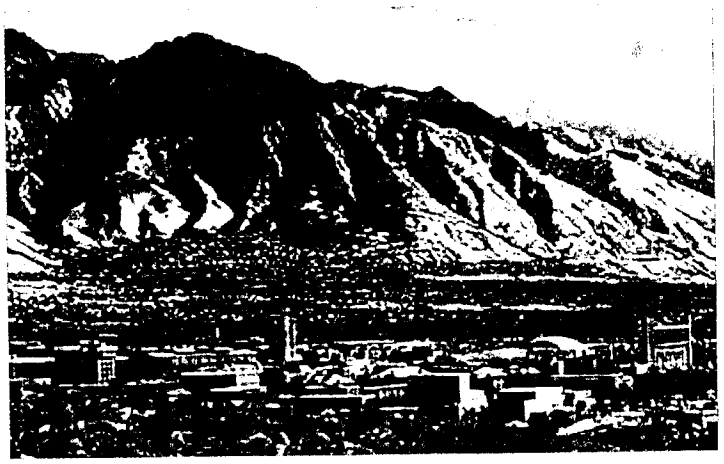
1. The other primary option considered was a traditional single duct VAV system with reheat coils. The advantages of using a VAV system with reheat coils at each box in this building are as follows:
   a. Individual temperature control. The University design guidelines require individual room temperature control wherever possible. This maximizes occupant comfort. Although this is not the only method to achieve individual temperature control, it is one of the most successful and reliable methods to do so. It is a tried and true successful system to accomplish this purpose.
   b. Energy efficiency. This system is still one of the industry's most energy efficient HVAC systems. It will reduce overall operating costs, as well as comply with current energy code requirements.
   c. Maintenance. This type of a system is an efficient system to maintain. In addition, it is very common on campus, and University personnel are experienced and well trained in maintaining this type of a system.
   d. Flexibility. This system is very flexible for future renovations and remodels. It can be adapted to different floor plans and zones fairly easily and inexpensively once it is installed.

2. The disadvantages of using a VAV system with reheat coils in this building are as follows:
   a. It is an entirely new system, and would need to be done at one time. It would require displacing all of the occupants for a long period of time (approx. 6-9 months) to completely remove the existing system, and install this one.
   b. This would be a more expensive system to install because all medium pressure ductwork, mixing boxes, etc. would need to be replaced regardless of age or condition.
   c. The fifth floor area would still be disturbed. It would not need to be entirely re-done. The low pressure duct and diffusers can remain, but the medium pressure duct and mixing boxes would still need to be replaced.









THE UNIVERSITY of UTAH

College of Nursing Master Plan

Vision Workshop Summary

Wednesday, January 5, 2005

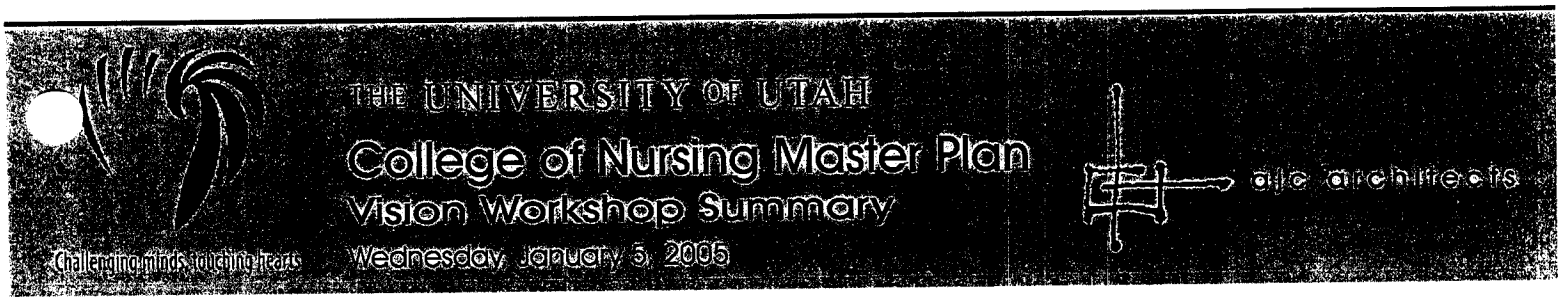
Challenging minds, touching hearts

a+e architects

table of contents

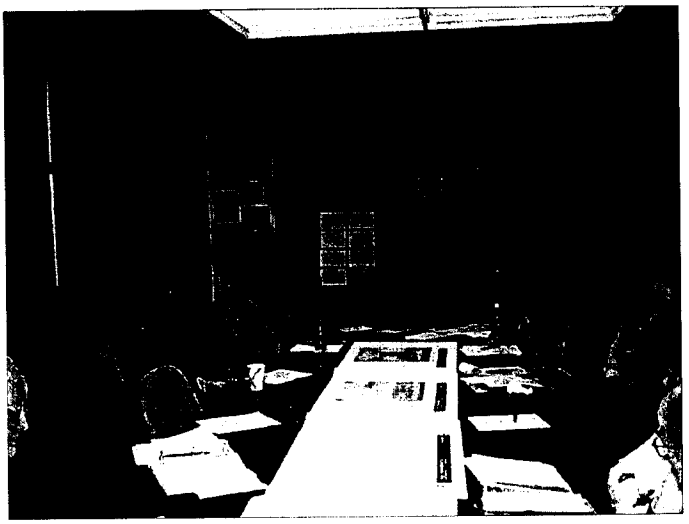
introduction

The purpose of this document is to summarize the College of Nursing Master Plan visioning session which took place January 5, 2005.



participants

Linda Amos	University of Utah, VP Health Sciences
Kari Astle	University of Utah, Facilities Planning
John McNary	University of Utah, Campus Design & Construction
Beth Cole	University of Utah, College of Nursing
Carole Gassert	University of Utah, College of Nursing
Mae Kramer	University of Utah, College of Nursing
Maureen Keefe	University of Utah, Dean, College of Nursing
Sue Huether	University of Utah, College of Nursing
Jill Jones	ajc architects
Elizabeth Blackner	ajc architects



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visioning session minutes

College of Nursing Master Plan

University of Utah Job #: 0588-12381
ajc architects project #: 0476

meeting date/time:	Wednesday January 5, 2005 @ 3:00pm
location:	College of Nursing Dean's Conference Room (4th Floor)
project status:	Master Plan Visioning Session

Agenda:

1. Welcome. Introductions:

   Jill Jones welcomed the participants and had everyone introduce him or herself.

2. Review Roles/Points of Contact.
   - Main Contact for the A/E (architect/engineering) Team: Liz Blackner
   - Main Contact for the CON: Catherine Coda
   - John McNary Project Manager UU Campus Design & Construction
   - Kari Astle, Project Manager UU Facilities Planning
   - Contact for HSEB information: Bill Billingsly
   - Contact Terry Olsen for Technology Information.
   - Contact Mike Perez for Central Planning.

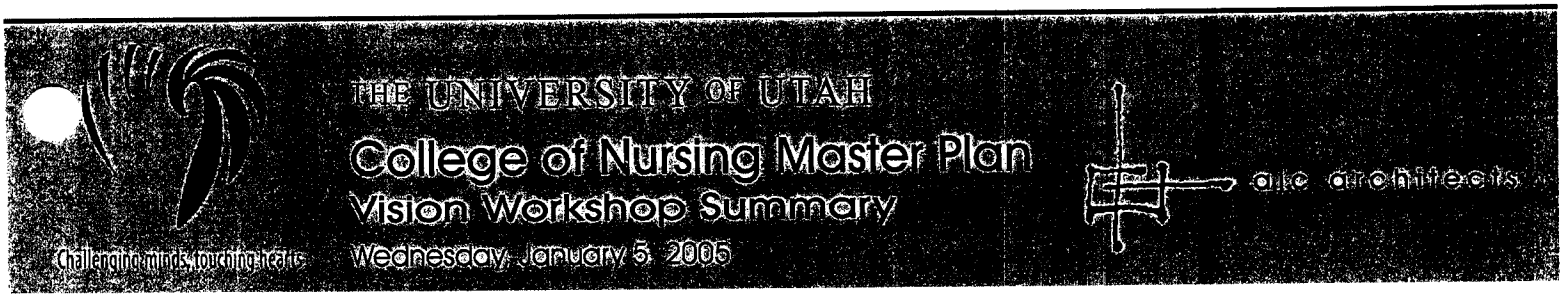
3. Review of master planning process and example products.

   Jill & Liz reviewed the master planning process for the benefit of those not present at the kick-off meeting:

   Visioning Workshop-Principles, Goals, Identify deficiencies and needs-This is what we are doing today.
   Existing Conditions Evaluation, Summary of existing space-This is underway. See item 4.
   Interviews-Focus Groups: Refine deficiencies and needs

   Focus groups identified:
   - IT/Computer
   - Faculty
   - Undergrad Students/Graduate Students
   - UU Facilities, including John McNary, Kari Astle, Mike Perez, Bill Billingsly, Pieter VanDerHave
   - Scheduling/Access/Security
   - Community Stakeholders, including Kevin Martin, Nancy Giles
   - ALT, including Susie Beck, Beth Cole, Carole Gassert, Sue Huether, Mae Kramer
   - Space Planning, including Bruce Gillars

703 east 1700 south
salt lake city, utah 84105
ph: 801.466.8818
fx: 801.466.4411
ajc@ajcarchitects.com



Options Workshop. Recommendations/Restack/Phasing-This is an interactive workshop where we present findings of visioning and focus groups, present and develop, evaluate, options to address facility deficiencies, growth and other issues as identified.
Budget Estimates-Develop budget estimates for options
Draft Document & Review Period
Final Document

4. Review status findings thus far on existing facilities analysis.
We have preliminary reports from the mechanical engineer and the structural engineer. The electrical engineer will be joining us after the visioning.

5. Visioning Brainstorming Session
Explain Purpose: To develop project principles, drivers and tools. It is important to keep the discussion on the big picture long-term ideals and not get bogged down in details.
Explain Format
Brainstorming.
Principles, Drivers, Tools
Principles: are overriding statements that everyone agrees are definitive and vital to the project.
Drivers: are forces which are acting on the project; they are reasons the project must to happen.
Tools: Are ways to achieve and implement the goals.

See Following pages for outcome of brainstorming session.

6. Visioning-Electrical Issues

Dave Weseman from Spectrum Engineers joined the meeting.

He summarized briefly existing conditions deficiencies:

- Not adequate space for electrical & telecomm equipment.
- Need separate spaces for telecom and electrical. Need about 10'x10' per floor.
- Need adequate emergency generator
- Need improvements to emergency lighting system
- Need to upgrade transformer.
- Currently a 7200 V system need 12,000 V system.
- Need to covert fully to Logiplex system.
- Need to improve energy efficiency.

The participants added the following concerns:

- Want more natural lighting. Would like to uncover windows that have been covered over.
- Want more flexibility with classroom lighting with dimming capabilities.
- Want classrooms to have same electrical and AV operation as HSEB
-

8. Next steps: Scheduling focus groups (Catherine), Continuing with existing conditions evaluation.

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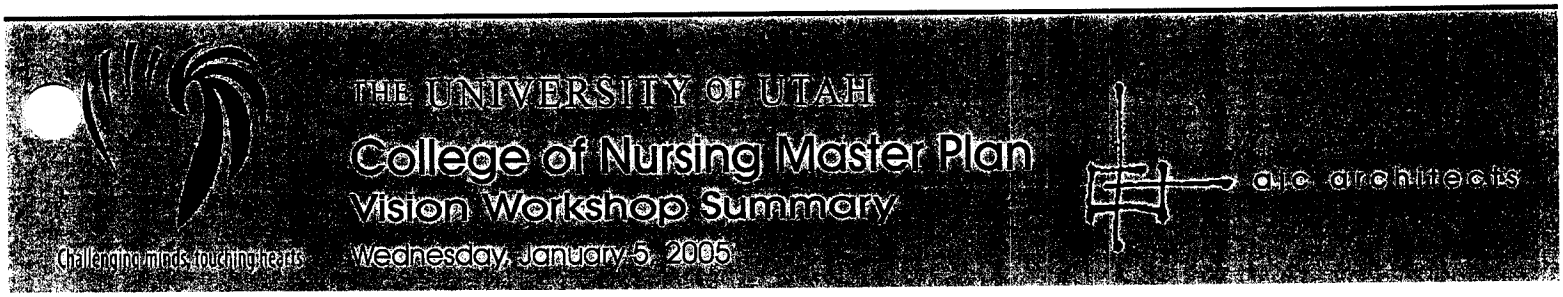
703 east 1700 south
salt lake city, utah 84105
ph: 801.466.8818
fx: 801.466.4411
ajc@ajcarchitects.com



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visioning guide questions

College of Nursing Master Plan

University of Utah Job #: 0588-12381
ajc architects project #: 0476

meeting date/time:	Wednesday January 5, 2005 @ 3:00pm
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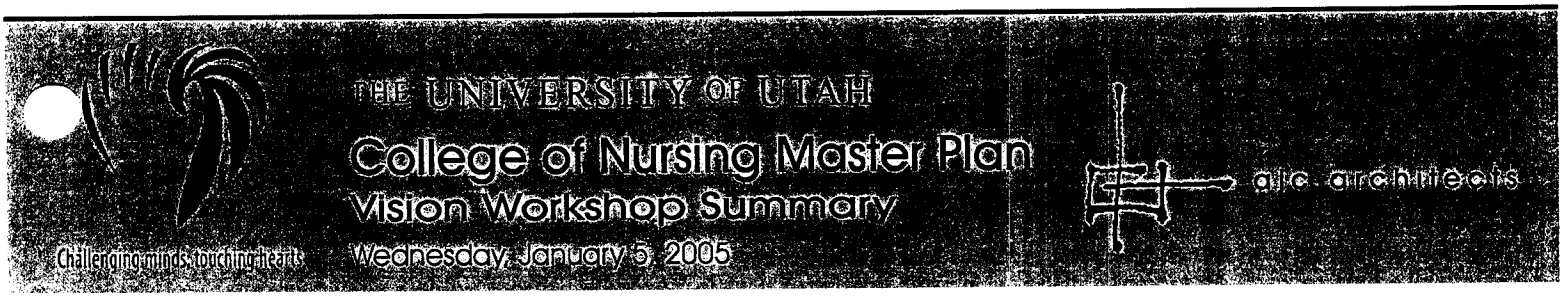
Guide Visioning Brainstorming Questions:

1. Review organization mission, vision, statements, strategic goals etc. Are these goals supported by the physical facilities? How do these relate to physical facilities?
2. Envision a "prefect place": What is it like?
3. If you were to build a new facility what would it want to be? What would it say to the students? What would it say about the college of nursing? What would it say to recruits?
4. What does the college of nursing want to be in the next 10 - 15 years? How is this different from what you are now?
5. How do you see the College of Nursing relationship with neighbors and the rest of Health Sciences changing over the next 10-15 years?
6. How do you see the College of Nursing relationship with west campus changing over the next 10-15 years?
7. How do you picture the ideal interface between the new HSEB and Nursing? What is the best-case scenario? What is the worst-case scenario?
8. What are the key adjectives or descriptive phrases that ideally would describe the College of Nursing? Do you have ideas about how the design or layout of physical facilities, or how features of the design could embody, express, and/or promote these words/phrases?



College of Nursing

The University of Utah College of Nursing supports the mission and vision of the University, and is an integral part of the Health Sciences Center. We serve the public by improving health and quality of life through excellence in nursing education, research, and clinical care. We endorse the following values of the Health Sciences Center:

- Compassion
- Collaboration
- Diversity
- Integrity
- Responsibility
- Excellence

In addition, we support the values of innovation, and caring.

Vision Statement

As a College, our vision is to develop leaders in nursing and health care whose actions, discoveries, and voices strengthen and transform the health of individuals and communities worldwide.

Mission Statement

The College of Nursing is a dynamic and evolving organization where we prepare all levels of professional nurses and scholars for diverse health care delivery and leadership roles. We offer interactive education in both nursing and gerontology. The College provides exceptional clinical care through innovative practice models. We are committed to developing knowledge that leads to improved health and quality of life.

Guiding Principles

The College of Nursing is positioned within an environment that respects the individual, fosters diversity, promotes community, cultivates life-long learning, and makes excellence an imperative. The action plans for education, research, and practice are located within the context of three organizing principles: 1) scholarship, 2) service, and 3) inclusiveness. As foundational elements, these principles inform and guide all activities for faculty, students, and staff.

Scholarship

The first organizing principle, scholarship, is defined in the broadest sense of the word, and includes the scholarship of analysis, critique, creation, and utilization. Scholarship is exemplified in excellent practice, inquiry based teaching, and the creation of new knowledge forms. Scholarly work includes publications, presentations, grant writing, and academic endeavors directed toward knowledge construction and distribution.

Service

The second organizing principle that informs all activities in the College is service. Faculty, students, and staff participate in the life and organizational work of the College and University through committees and taskforces. Faculty participate in professional organizations, review panels, and service activities. As a form of service, faculty also engage in public presentations, public education, and volunteer work directed toward promoting health in individuals, families, and the community.

Inclusiveness

The third principle is organized around the cultivation and implementation of diverse ideas, perspectives, and beliefs in the College. This orientation influences the policies and practices of the College and guides student, faculty, and staff recruitment. The outcomes to be achieved and maintained by this organizing principle are: 1) the development of a culturally relevant and sensitive curriculum, 2) the delivery of culturally competent care, and 3) the creation and maintenance of an inclusive community.

Strategic Initiatives 2004 – 2007

Goals

The following four major goals form the basis for strategic planning and resource investments for the College of Nursing over the next three to five years:

1. **Addressing the nursing shortage and nursing faculty shortage in Utah and across the country**

   Currently we are involved in several innovative collaborative student preparation partnerships:

   - Student nurse internships
   - Post graduate nurse residency
   - Expand RN-BS options and add long-term care specialty
   - Service-Learning

   We have also expanded our faculty preparation and faculty resources through:

   - Teaching in nursing specialization track
   - Clinical faculty associates model
   - Accelerated BS to PhD program

   We will be exploring additional educational innovations to expand access and enrollments though:

   - 2nd degree options for students with degrees in other fields
   - Explore Clinical Nurse Leader partnerships and affiliations
   - Expand innovative models for doctoral education including; PhD specialty foci, distance options, Western Interstate Commission for Higher Education collaborations and faculty and student exchanges
   - Expand tenure track faculty and funded research programs to support growth in graduate education
   - Create additional Faculty Fellowships and scholarships
   - Market and expand Teaching in Nursing Masters Specialty & Post Masters Certificate programs

2. **Enhancing quality and access to nursing and gerontology education through innovative technology-based delivery modalities.**

Currently we lead the University in programs and courses utilizing distance technology in the following:

Web-based programs:	RN to BS Gerontology Certificate program Teaching in Nursing MS & Certificate Rural NP Program
Teleconferencing:	PhD in Oncology Nursing

Our goal is to become know nationally for:

- Best practices in using innovative technology and pedagogy
- Our research initiatives in evaluation and educational research
- Our pioneering work in simulated learning and other new technology –based teaching modalities such as IP Video and PDAs.
- Setting the stage and role modeling best practices in the new interdisciplinary HSE building in collaboration with the Eccles Library
- Build on our success and national notoriety for the distance based PhD in oncology nursing doctoral program and expand it to other models & other specialties
- Creation of a Center for Simulated Learning– Critical Care and other Modules

3. **Advance recognition for research through sustained extramural funding and collaborative activities**

The College of Nursing is currently ranked 20th in NIH funding out of over 500 schools of nursing in the U.S. The impressive growth in extramural funding has risen from $350,000 to $1,465,000 in the past five years.

Our objectives in this area are to sustain faculty productivity and visibility and to:

- Support additional clinician researcher teams/partnerships.
- Expand portfolio and diversify grant funding sources to include funded centers, cores and institutional pre and post doctoral awards and funding from additional agencies.
- Increase number of interdisciplinary funded research projects in several foci – cancer, aging, pain, women & children (informatics & genetics)
- Explore and expand interdisciplinary research and education opportunities:
  - Center on Aging/Gerontology
  - Medical and Nursing Informatics
  - Genetic counseling and Neuroscience
  - Alternative and Complementary Healing
  - Evaluation/Educational Research

4. **Align our clinical and educational endeavors with Health Science Center (HSC) areas of clinical emphasis and other clinical partners' strengths and interests.**

Currently we are serving the medically underserved through our faculty practice and community outreach initiatives:

- Expand access to services through the use of NPs in community sites and incorporate the use of telemedicine links
- Increase the College of Nursing presence in the Huntsman Cancer Hospital in both the research and clinical service areas.
- Expand and promote the Center for Aging as the model for elder care regionally and nationally.
- Expand and market our expertise in pain management, end of life and palliative care as part of the Caring Connections: Center for Hope and Grief.
- Prepare and utilize advanced practice nurses with genetic counseling skills.
- Integrate psychiatric mental health clinicians and services into primary care settings.

principles

Master Planning for the College of Nursing needs to:

- Provide connectivity & interconnectivity, support other disciplines in this building, create a sense of community, and increase collaboration.

- Include planning that provides flexibility.

- Position ourselves for information technology.
  - Teaching with technology
  - Distance delivery
  - Leaders in Information Technology
  - Integrate IT with the Health Sciences & research park
  - Send visual message of technology

- Emphasize generation of knowledge.

- Provide for a safe environment & building for occupants.
  - Asbestos free
  - Life Safety Codes
  - Seismic

- Provide concepts that honor & integrate the historical development of CON.
  - Continuity--art, architectural design, displays.

- Incorporate accessibility issues--CON needs to be the role model.
  - Need to accommodate aging & retiring faculty--how to keep them a part of us?
  - Accessibility for the aging.

- Support a sense of "home" for the students.
  - Design in this sense of home--virtual student lounge.
  - Need to create a homebase.
  - HSEB will affect how we use our existing space.

- Support self-directed, independent thinking.
  - Learning facility should support this concept!
  - Need to create a sense of technology advancement, engaged with others.
  - Individual self learning yet feeling connected & a part of technology.

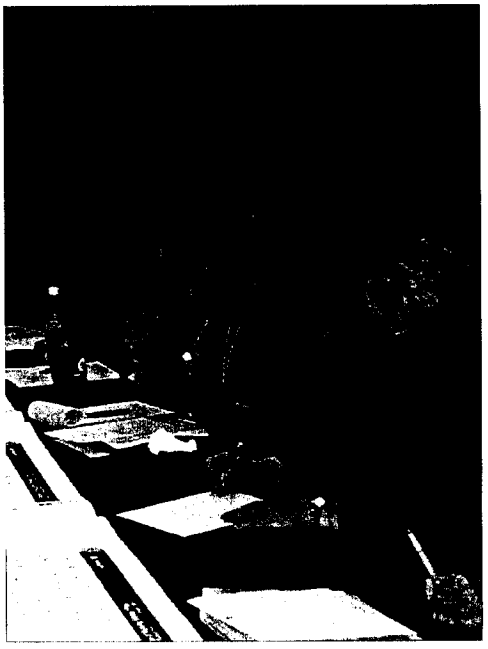
drivers

- Need more space--convert all of our classrooms & convert to offices.
  - How to make building bigger?
  - New space--capture A Level parking?
  - Need to accommodate growth in faculty & provide more research space.
  - Growth in student enrollment--undergraduate & graduate.
- What is our main floor? It is confusing.
- Value & do not want to lose parking. Parking is critical for clinic.
- Need more daylight / natural light & controls for daylight.
  - Uncover windows & use shading device for protection.
- Need more flexible lighting.
  - Dimming
- Need to be more energy efficient.
- Need more closets--telecom, phone, & electrical.
  - Stacked core closets

drivers (continued)

- Need bigger and newer emergency power generation to meet today's standards.
- How to physically **enhance connectivity** with the rest of the campus.
  Remote access--where will students be?
- Provide **stress relieving opportunities** through design.
  Build exercise into the workplace. (Probably not a devoted exercise facility.)
- How will the **demolition of 521** affect CON?

  Loss of { Classrooms, Cafeteria, Conduit to hospital }
- How will **HSEB** affect CON?
  Can we convert classrooms to offices?
  Will change use of existing space.



drivers (continued)

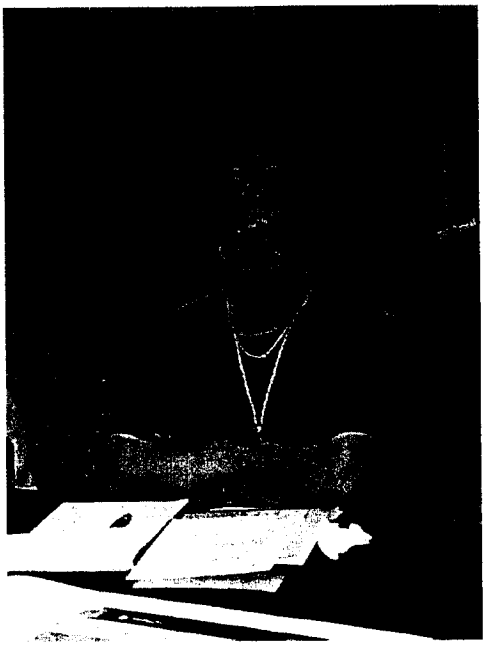
- We like this **site**. This is a driver to stay at current location & renovate.
- The building is not ugly. This is a driver to stay at current location & renovate.
- What affect will **future pharmacy building** have on CON?
  Potential open space at existing pharmacy building location?
  CON has the rights to air space over Skaggs Pharmacy.
- Need to **replace & upgrade building systems**.
- Access from 1st & 2nd Floor needs to be improved.
- Need to **update image** with a new "front" on building.
- Smaller casebase
  Interactive--while still building relationships.
- Who (and where) are our customers?

tools

- Free to convert existing classrooms.
  Want faculty to teach in the new HSEB.

  Building { Wireless / Paperless

- Technology for **now** & the **future**.
- Are there programs here that can really benefit from other disciplines?
  How can **space** support this interaction?
- Perhaps **relocate** **student** **services** to the 2nd floor.
- All of these "practices" do not take place within the CON building.



tools (continued)

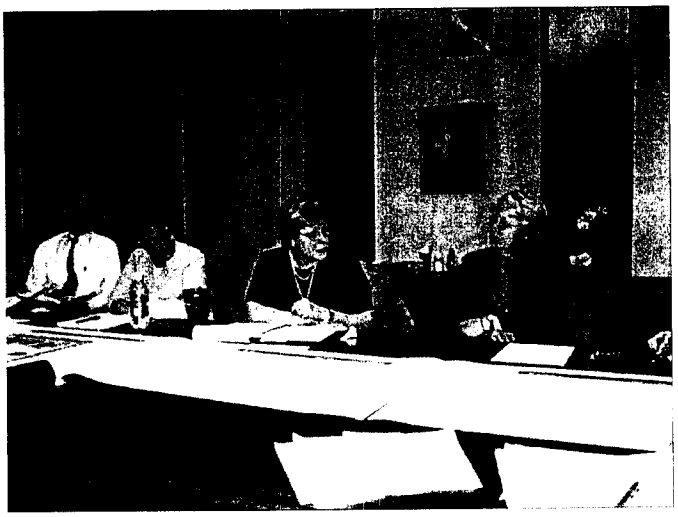
- Openness--
  - New adjancencies. Want to be part of the "network"--connected.
  - Relationship (hopefully) with the:
    - New library plaza
    - HSEB--(future) south academic building
    - Close to the rest of the Health Science
- Increase connectivity with west campus--humanities, languages.
- What would happen if we have a major west access / entrance to the building?
- Improve entrance to nursing, HSEB, & west campus.
  - Connected with alignment & material
  - Covered?
  - Need to improve accessibility
  - Is it a given that the 2nd level is the "portal" / main floor?
  - Front (east) entrance is crumbling. Renovate?
- Someway to get from building to building without getting wet!

tools (continued)

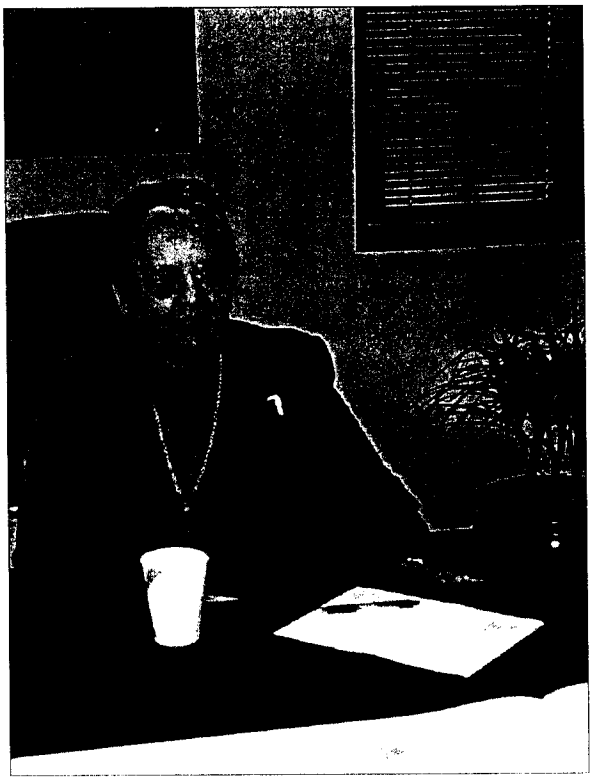
- Mold the environment so that you run into one another.
- Open-up the walls--replace with glass.
  Let people "see" what is happening here.
- Security is important in relationship to openness.
- Lobby area with see through glass.
  Some of the technology soft space and hard spaces.
  PR space & lounge space.
- Possibility of incorporating concept of information commons. If so, where can this be?
- Original design concept was an open interior stairway. Can we re-open it?
- Connected--open, light & bright.

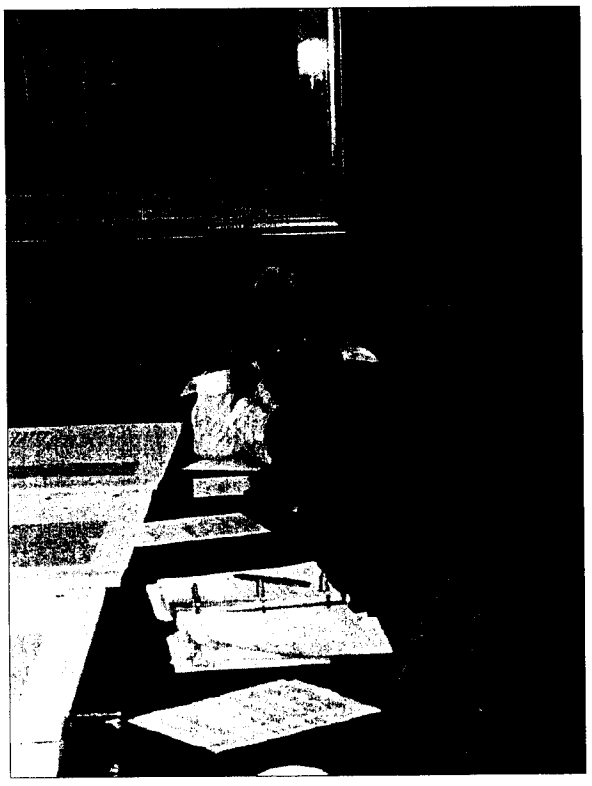
program

- Do we focus on teaching in this building? Or does HSEB take care of this space?
- Predicted 80% utilization of HSEB classrooms upon opening. May not need new classroom space / student spaces in this building.
- Need (2) 75-person classrooms. Rooms 202, 217, 218 to be combined. (To be set up the same as HSEB. Project already underway.)
- Space for **preparation** for teaching.
  Where should / can this take place?



photos





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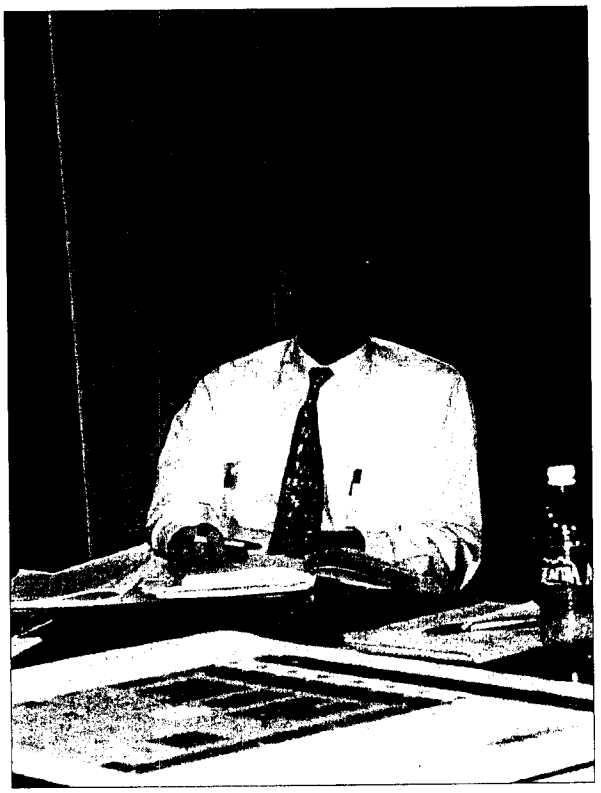

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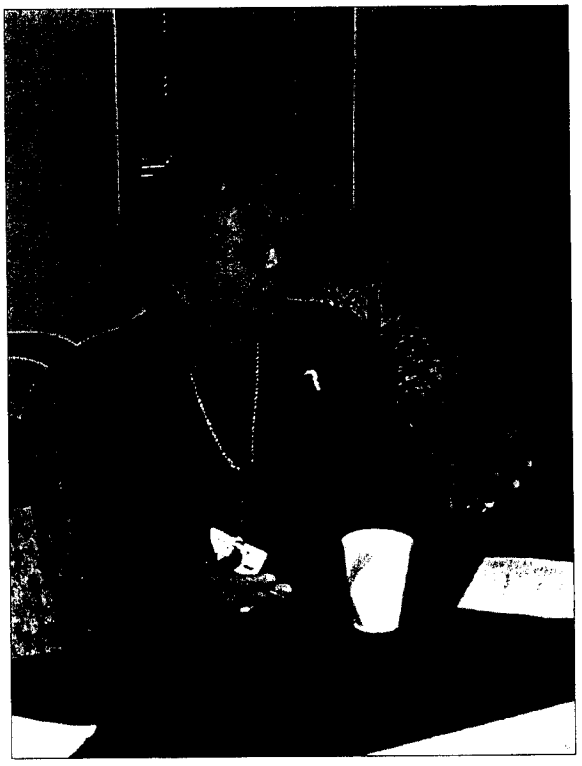

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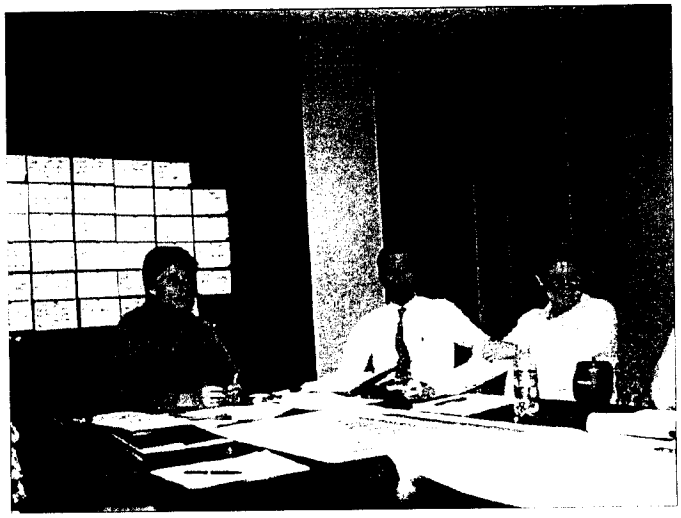

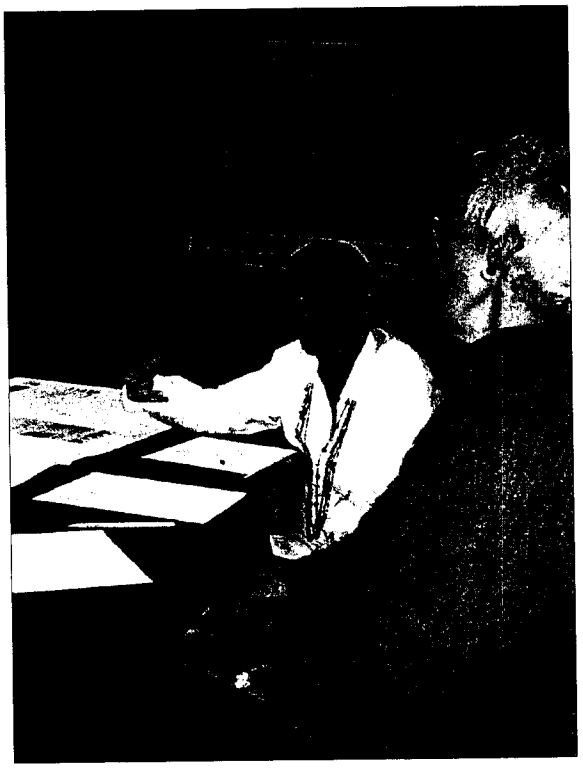

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focus group input summary

College of Nursing Master Plan

University of Utah Job #: 0588-12381
ajc architects project #: 0476

meeting date:	Focus groups input sessions were held Feb 1-2, 2005 Technology ALT Nursing Faculty Students Community Nursing Staff Collaborative, Interdiciplinary Make-up Meeting
issue date:	February 9, 2005
project status:	Master Plan Interviews

703 east 1700 south
salt lake city, utah 84105
ph: 801.466.8818
fx: 801.466.4411
ajc@ajcarchitects.com

General

Systems

- Security is an over-riding concern
- Modern technology important for image and future-make evident.

Quality of Space

- Provide operable windows
- Make building more accessible (longer hours) so students could study in eves. Need access to computer lab areas after 5:00.
- Coffee/Snack Kiosk
- Nursing has existed in a vacuum. Increase the mixing of disciplines.
- Need to make building a resource and have attractions (like LR&SC) to bring in others from Health Sciences.
- Important to have locker room and shower (for people who bike or run) somewhere in Health Sciences. (Exists in HSEB?) Need to be able to exercise on lunch break or between classes. Exercise equipment would be great!
- Image of Nursing is pretty good and has improved.
- Building has been well tended and well loved.
- It's a good building -- a good location.
- Concern of building looking "dowdy" next to new building.
- Make whole building match 5th floor. (Quality of space—level of finishes).
- The more we can be like HSEB and model after HSEB the better.

Master Plan

- Bridge to HSEB on upper levels...do not rule out. Some feel unnecessary since HSEB is so close. Closest discipline! Spend money elsewhere?
- Exiting from south stair is awkward. Have to go outside on first level. Fix.
- Stairways are too hidden. Not evident enough where stairs are as alternative to slow elevator.
- Roof garden would be great.
- Protected outdoor space would be nice.
- Increase Natural Light-example: Remove coverings over existing windows on 2nd floor.
- Need more men's restrooms.
- First floor feels cut-off from rest of building. Integrate better.

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salt lake city, utah 84105
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fx: 801.466.4411
ajc@ajcarchitects.com

- Must plan for growth-space needed to meet initiatives-must have a way planned to grow-out over pharmacy? Infill at covered parking. Unpopular but probably inevitable.
- Building usage feels disjointed. 5th floor has helped.
- 2nd floor is not configured well. Needs to be organized better. Retain student hang out space.
- Add and entrance to west or north

Classrooms

Systems

- Should be upgraded to have same technology and operation as HSEB.
- Help button at podium-standardize with HSEB

Quality of Space

- Projection screen and white/smart boards should both be useable at the same time.
- Moveable furniture and equipment better than fixed seats.
- Nursing –we like to talk a lot. Horseshoe configuration in classrooms would improve ease of interaction.
- Bigger work-surfaces needed for laptops and books.
- One 75-person classroom should be made a distance classroom. (HSEB has 40 person distance ed classrooms)

Master Plan

- 75 person classrooms are size needed. (2 are being planned on second level)
- Keep common use classrooms in scheduling pool on 2nd level. Extension of educational plaza.
- Need more seminar rooms like 564. Love it.
- Eliminate outdated unusable awkward classrooms on 2nd floor.
- Computer classroom-keep this function in building and enlarge to 20 stations.
- Classroom 580 not a good one, and not appropriate on 5th floor. Convert to research.

Break Out Rooms

Systems

- White boards and overhead projection in break-out rooms.

Quality of Space

Master Plan

- Need rooms for 4-6 students to work together on projects, white boards etc. (similar to business building)
- Request also for (6) breakout/seminar rooms for 10-15 people located near 75 person classrooms, so large class could distribute to smaller break out rooms for projects.

Auditorium

Systems

- Upgrades needed-new podium to match HSEB, better lighting controls, screen etc.

Quality of Space

- Chairs do not work for larger body types.

Master Plan

- To remain. (Size OK and location good).

Technology

Systems

- Asbestos removal key to allow technology upgrades needed.
- Need entire building to be wireless
- CON computer services needs to help with classroom problems when help button pushed.
- Computer stations (at least some of them) should be made accessible to students not accepted into program-but that are taking classes in building.
- Nursing is one of biggest users of distance education. Need to accommodate.
- Nursing computer services has been integrated with ITS? Who handles servers? Terri? Wayne?

Quality of Space

Master Plan

- There will be a new Dean for Technology & Informatics. (Carole) Additional space needed.
- Reduce storage space need through technology.
- Informatics is a huge growth area. Will HSEB be adequate-do we need to provide space in nursing? If so, how much what kind?

Computer Lab

Systems

- On site computer support is crucial (2 support stations).

Quality of Space

Master Plan

- General services student facility should be maintained in building to some degree. Do not want to lose funding. Currently funded for 37 stations.
- Break computer area into zones-more informal area where food is allowed and more formal area where food is not allowed.
- Computer stations (10-15) needed for class prep-word processing etc. (This function is NOT being provided in LR&C concept.)
- Idea to locate in infill of covered parking to tie into Eccles plaza project?

Event Space

Systems

Quality of Space

Master Plan

- Need space for special meetings and seminars etc.
- Need serving/kitchen area to support receptions
- Provide space for History of Nursing displays
- Provide space for Alumni Space/Gamma Rho-Sigma Theta Tau

Student Lounge

Systems

- Provide wireless support for laptops.

Quality of Space

- Billiard table requested.
- Undergrads need work space and informal study space. Desks with laptops, round tables.

Master Plan

- Maintain student lounge (not large 500-600SF) in Nursing Building to provide a sense of "HOME". This lounge will be in addition to the dedicated nursing lounge in HSEB and the general health sciences lounge in HSEB.
- Can student lounge function overlap with computer lab function?
- Need places for group study-Lounge should function for informal group study. (break out rooms for formal group study)
- Consider student lounge adjacent to LR&SC.
- Kitchenette-could be shared with event space kitchen?

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703 east 1700 south
salt lake city, utah 84105
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ajc@ajcarchitects.com

Student Services

Systems

Quality of Space

- Glass enclosed-visible yet contained.
- Counseling occurs in offices.
- Windows wanted

Master Plan

- This component of administration should move to 2nd floor to be more accessible to students
- Need secure room for files. Files will be digitized so less space is needed.
- At least one more office will be needed than exists now.
- Need copy/work space area
- Student lockers files and mailboxes-where to locate how to handle privacy?

Building Reception Function

Systems

Quality of Space

- Provide display board with days events and scheduling of rooms etc. (similar to HSEB)
- Improve way finding through signage.
- Improve welcoming feel for guests/first time visitors.
- Don't anticipate a staff person devoted to reception. Questions that aren't answered through signage and display will be handled by student services.

Master Plan

- Do not need a designated reception space.

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salt lake city, utah 84105
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Administration

Systems

Quality of Space

Master Plan

- Cluster Dean's or spread them out? No clear direction.
- Do not move to 2nd floor-too much going on.
- New Dean for Informatics Technology—additional space needed.
- Do not anticipate much growth
- Business offices are scattered-would be better clustered & close to Dean's office
- Reinforce central administration core
- Directors of graduate and undergraduate studies need to be clustered with Admin.
- Need a secure receiving area/mail room. What is new model for mailroom now that moving towards paperless?

Faculty

Systems

Quality of Space

- Building is home for faculty: HSEB is for students.
- Would be nice to have window and view out of faculty lounge.
- Shared offices-how to make work with confidentiality needs? Faculty does not think sharing works.

Master Plan

- Growth anticipated-10 full time offices, and flex –10-15%
- Need flexible offices for temporary faculty & visiting VIPs
- Consider spare offices for part-time faculty (currently 6-8, number will increase) (semi-retiring)-flexible, configured so that people can take turns being in it. Need to be able to meet with students in these.
- Faculty lounge should have at least part of it be private area to get away. Current location is "too open". Some like, some don't.
- Faculty probably has more lounge/break room space than they need. Could be smaller. (4th and 5th floor combine into one.) This also would help with hierarchical feel of 4th and 5th floor now.
- Need to keep faculty units (such as NP) in tact. Do not split.
- TA's need space

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Clinical

Systems

Quality of Space

Master Plan

- Potential for existing clinics (Caring connections and Psychiatric Family Medicine (Anne Hutton). Any new clinics to move to Research Park to free up space in building.)
- Better access for clients at Research Park. It seems it will get increasingly difficult to park close to the nursing building.
- Easier to grow and get space in Research Park.
- Need to consider creative "office-ing" ideas for clinical full (currently 62) and part time faculty (currently 24)-not here full time.
- CFA (Clinical Faculty Associate) space could be shared. Need phone privacy. Need space for 10 bodies.
- Midwifery-probably stays since all clinical is off-site.

Centers

Systems

Quality of Space

Master Plan

- Center on Aging-stay in building
- Gerontology may move to college of health? May not stay in building.
- Potential for new centers?

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fx: 801.466.4411
ajc@ajcarchitects.com

Research Space

Systems

Quality of Space

Master Plan

- Growth anticipated @10-15%
- Need space for RA's-modular cubicles OK 12-20 additional stations
- Need space for post docs (6-7 private offices)-need privacy for student counseling. Could be shared.

Staff Space

Systems

Quality of Space

- Needs to have friendly and efficient feel.

Master Plan

- Needs to be configured purposefully-is haphazard now.
- Tech Support Services is a separate unit of staff
- Staff needs private break room separate from students and faculty. Need a place to get away. Would like couch to lie down. Would like a window. Would like a treadmill.
- Currently about 35-40 staff
- Need secure file rooms.

Student Enrollment

Systems

Quality of Space

Master Plan

- Growth-would like to grow, but limited by funding.
- Want to have space to grow if funding is increased.
- Most growth anticipated in masters and doctoral programs (research).
- BA may grow +25-30????? Depends on funding.

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fx: 801.466.4411
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Parking

Systems

Quality of Space

- Need improved shuttle service!
- Some recognize that nursing may reach a point when space needs outweigh parking convenience.
- Parking not as important as meeting missions-help with nursing shortage!
- Keep in mind-Eccles plaza project has 3 levels of parking

Master Plan

- Valued, want to keep. Some very adamant!

LR&SC

Systems

Quality of Space

Master Plan

- Does not need windows. Locate in place with least access to windows.
- Do not locate on 2nd floor-expensive equipment too accessible.

Storage

Systems

Quality of Space

Master Plan

- A lot of "junk" being stored. There is a lot of "junk" in 101 and 586. Space devoted to storage could be reduced.
- Files to be digitized. Further reduce storage space needs.
- Locate in infill of covered parking –support for concept except major resistance about losing parking

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703 east 1700 south
salt lake city, utah 84105
ph: 801.466.8818
fx: 801.466.4411
ajc@ajcarchitects.com

Wilson
Consulting
Services, Inc.

7 April 2004

Mr. Scott Jefferson
University Of Utah
Campus Design and Construction
V. Randall Turpin University Services Building, Rm. 201
1795 E. South Campus Drive
Salt Lake City, Utah 84112-9403

RE: Asbestos Abatement Project Design and Budget Figures for Removal of Ceiling Tile and Spot-Removal of Fireproofing in the College of Nursing Sprinkler System Upgrade Project

Dear Mr. Jefferson:

As per your request, I have compiled information on two potential, workable project designs for ceiling tile removal and accompanying spot-removal of fireproofing in the College of Nursing. I have also included abatement budget figures for ceiling tile and fireproofing removal as well as consultant fees to perform an initial asbestos inspection, prepare a scope of work/removal specifications package, and perform project monitoring. I will discuss the two different project design scenarios first, and then discuss the accompanying budget figures.

Project Design Option #1 – Removal of Ceiling Tile Grid

This project design involves completely removing the ceiling tile grid. A variance from the State of Utah Division of Air Quality (DAQ) will be required for spot abatement of fireproofing. Additionally, the DAQ will likely require a contingency or emergency plan in place if remaining fireproofing is disturbed by workers installing the sprinkler system. The following points of discussion are presented in the order they should occur for a successful abatement:

1) Assume that the College of Nursing Abatement will be divided into phases consisting of ½ floor per phase, totaling 10 phases of abatement at approximately 8,000 square feet each. Note; exact measurement information will not be known until inspection is completed.
2) Abatement contractor will construct full containment with 3 poly layers for ceiling tile removal.
3) After ceiling tile is abated, inner layer will be removed, air clearances will be performed and the containment will be opened to the sprinkler contractor in order to mark anchor locations for sprinkler system.
4) Abatement contractor will then spot abate anchor locations, bridge encapsulate around spot abatement, spray encapsulate the remaining fireproofing and install anchors under

full containment and negative pressure. Installing anchors under these conditions should alleviate any concerns if fireproofing is disturbed during the installation process.

5) Abatement contractor will then encapsulate and remove the 2nd layer of poly and air clearance sampling will again be performed within this containment.
6) Assume that this abatement design will require approximately two weeks (ten working days) for containment set-up, abatement, and clearances.
7) After containment is cleared, sprinkler contractor and/or other contractors will be allowed into area. 1st layer of containment and critical barriers will still be in place, but the area will not be "regulated" with asbestos warning signs. HVAC system will still be shut down in this area. Any contractor working within this area or related to this project will be OSHA asbestos-awareness trained (2-hour course) and will know what to do if fireproofing is disturbed during the installation process. The asbestos abatement contractor will need to make a crew available immediately for any emergency clean-up during the sprinkler installation process. Any clean-up process will require that the sprinkler contractor and/or other workers vacate the area at once in order to allow the clean-up process to take place immediately.
8) Sprinkler contractor, plumbers or any contractor working within the contained area and around the existing fire proofing should be subject to personal air monitoring for the first few phases in order to determine if the work practices are sufficient to keep the worker under the OSHA permissible exposure level (PEL). If the OSHA PEL is exceeded or if excessive fireproofing disturbance is noted, then work will stop until a determination can be made as to how to proceed with the project.
9) At this point, it should be noted that if this work cannot be performed successfully with air monitoring results under the OSHA PEL, then there is a possibility that this project will need to be re-defined with more stringent worker (plumber/sprinkler system installer) training.

The advantages of Option #1 are the ease of building the containment with less time required than if the grid were to be left in place; ease of ceiling tile and fireproofing removal; and accessibility during the sprinkler system installation phase.

The disadvantages of this option are the cost of replacing the grid; the possibility of light fixture damage; and the potential of fireproofing overspray disturbance during ceiling tile grid re-installation.

Project Design Option #2 – Ceiling Tile Grid Remains In Place

This project design involves leaving the ceiling tile grid in place. A variance from the State of Utah Division of Air Quality (DAQ) will still be required for spot abatement of fireproofing. Additionally, the DAQ will also likely require a contingency or emergency plan in place if fireproofing is disturbed by workers installing the sprinkler system. The following points of discussion are presented in the order they should occur for a successful abatement:

1) Assume that the College of Nursing Abatement will be divided into phases consisting of ½ floor per phase, totaling 10 phases of abatement at approximately 8,000 square feet each. Note; exact measurement information will not be known until inspection is completed.
2) Sprinkler contractor will mark locations for anchor bolts on ceiling tile with paint, taking care not to disturb the surface of the ceiling tile. Abatement contractor will transfer the marked location to the fireproofed substrate and double-check measurements before spot-abatement of fireproofing while under containment.

3) Abatement contractor will construct full containment with critical barriers and 2 poly layers for ceiling tile removal and fireproofing spot abatement. In order to build containment, the building owner must be prepared for the inevitability of some ceiling tile grid removal in order to accomplish containment construction. The grid removal will take place in areas around the perimeter of the specified containment area, and also in areas where spot abatement will occur; however, the majority of the grid will be left in place to support lights and other fixtures.
4) Abatement contractor will spot abate the fireproofing in areas where anchor locations were marked on ceiling tile, bridge encapsulate around spot abatement, and then spray encapsulate the fireproofing utilizing all areas where ceiling tiles and grid were removed for containment construction. The ceiling tile will be left in place during the encapsulation process in order to capture any overspray and keep the grid from becoming covered with encapsulant.
5) After the encapsulation process, the abatement contractor will abate the ACM ceiling tile, the 2nd layer of poly will be encapsulated and removed, and air clearances will be performed.
6) Assume that this abatement design will require approximately two weeks (twelve working days) for containment set-up, abatement, and clearances.
7) After containment is cleared, sprinkler contractor and/or other contractors will be allowed into area. 1st layer of containment and critical barriers will still be in place, but the area will not be "regulated" with asbestos warning signs. HVAC system will still be shut down in this area. Any contractor working within this area or related to this project will be OSHA asbestos-awareness trained (2-hour course) and will know what to do if fireproofing is disturbed during the installation process. The asbestos abatement contractor will need to make a crew available immediately for any emergency clean-up during the sprinkler installation process. Any clean-up process will require that the sprinkler contractor and/or other workers vacate the area at once in order to allow the clean-up process to take place immediately.
8) Sprinkler contractor, plumbers or any contractor working within the contained area and around the existing fire proofing should be subject to personal air monitoring for the first few phases in order to determine if the work practices are sufficient to keep the worker under the OSHA permissible exposure level (PEL). If the OSHA PEL is exceeded or if excessive fireproofing disturbance is noted, then work will stop until a determination can be made as to how to proceed with the project.
9) At this point, it should be noted that if this work cannot be performed successfully with air monitoring results under the OSHA PEL, then there is a possibility that this project will need to be re-defined with more stringent worker (plumber/sprinkler system installer) training.

The advantage of Option #2 is the cost savings associated with keeping the ceiling tile grid in place, with minor repairs anticipated.

The disadvantages of this option are the extra time required to work around the ceiling tile grid which will result in a slightly higher abatement cost; and the increased difficulty working around the grid for abatement and sprinkler system workers. Additionally, there is a possibility that the grid will retain some of the encapsulant during the application process, and that some of the grid will be damaged during the abatement and/or sprinkler installation process.

Budget Figures for Asbestos Abatement Contractor

As stated before, the exact square footage of materials to be abated will not be determined until the asbestos inspection has been performed. For the purpose of preparing an abatement budget for this project at this time, several assumptions will need to be made:

Assumption 1) College of Nursing sprinkler system upgrade will be handled in phases consisting of ½ floor per phase.

Assumption 2) All areas of ceiling tile with the exception of the newly-remodeled 5th floor areas will be removed. This is due to the fact that there is ACM fireproofing above most areas of ceiling tile in the building, with the potential for ACM debris and contamination on the top-side of existing ceiling tile. Areas of ceiling tile with fireproofing insulation above will be handled via full containment.

Assumption 3) Each phase of abatement will take approximately two weeks. In some areas where there are many small rooms, the set-up may take longer that in areas where larger rooms or open space is present. The average set-up time is proposed to take one week (5 working days), and the average abatement time is proposed to take one week (5 working days). Contingencies should be built into the time allotment for each phase in order to accommodate more difficult set-up in some areas.

Assumption 4) Some areas of fireproofing overspray on conduit and fixtures above the ceiling tile may also need to be abated in order to facilitate installation of sprinkler system. These areas will not be defined until the asbestos inspection has been completed. Costs for this possibility have not been included in budget figures.

Budget Figures for Design Option #1

Location	**Phase #**	**Ceiling Tile Removal and Encapsulation Sprayback**		**# Spot Removal Areas/phase**		**Mobil. Charge**	**Total**
		Ft²	*@ 2.50/ Ft²*	#	*@ 20/ea**		
5th Floor	One	4300	10,750.00	48	960.00	750.00	12,460.00
4th Floor	Two	8350	20,875.00	78	1,560.00	750.00	23,185.00
4th Floor	Three	8350	20,875.00	78	1,560.00	750.00	23,185.00
3rd Floor	Four	8350	20,875.00	74	1,480.00	750.00	23,105.00
3rd Floor	Five	8350	20,875.00	74	1,480.00	750.00	23,105.00
2nd Floor	Six	8350	20,875.00	99	1,980.00	750.00	23,605.00
2nd Floor	Seven	8350	20,875.00	99	1,980.00	750.00	23,605.00
1st Floor	Eight	8350	20,875.00	73	1,460.00	750.00	23,085.00
1st Floor	Nine	8350	20,875.00	73	1,460.00	750.00	23,085.00
Lower Level & Sub Bsmt.	Ten	4400	11,000.00	19	380.00	750.00	12,130.00
**Extras				108*	2,160.00		2,160.00
Grand Total							**212,710.00**

*Price estimated of $20.00 per spot removal (fireproofing) does not include installation of anchor bolt. This installation charge is not included in the abatement budget estimate total given. I estimate the combined spot removal/installation charge to be approximately $100/location.

**Extras on this budget proposal include an estimated 15% addition to the number of anchors that may be required for the sprinkler system alarm system as per Craig Blue.

Budget Figures for Design Option #2

Location	Phase #	Ceiling Tile Removal and Encapsulation Sprayback		# Spot Removal & Anchor Installation		Mobil. Charge	Total
		Ft²	*@ 2.75/ Ft²*	#	*@ 20/ea**		
5th Floor	One	4300	11,825.00	48	960.00	750.00	13,535.00
4th Floor	Two	8350	22,962.50	78	1,560.00	750.00	25,272.50
4th Floor	Three	8350	22,962.50	78	1,560.00	750.00	25,272.50
3rd Floor	Four	8350	22,962.50	74	1,480.00	750.00	25,192.50
3rd Floor	Five	8350	22,962.50	74	1,480.00	750.00	25,192.50
2nd Floor	Six	8350	22,962.50	99	1,980.00	750.00	25,692.50
2nd Floor	Seven	8350	22,962.50	99	1,980.00	750.00	25,692.50
1st Floor	Eight	8350	22,962.50	73	1,460.00	750.00	25,172.50
1st Floor	Nine	8350	22,962.50	73	1,460.00	750.00	25,172.50
Lower Level & Sub Bsmt.	Ten	4400	12,100.00	19	380.00	750.00	13,230.00
**Extras				108*	2,160.00		2,160.00
Grand Total							**231,585.00**

*Price estimated of $20.00 per spot removal (fireproofing) does not include installation of anchor bolt. This installation charge is not included in the abatement budget estimate total given. I estimate the combined spot removal/installation charge to be approximately $100/location.

**Extras on this budget proposal include an estimated 15% addition to the number of anchors that may be required for the sprinkler system alarm system as per Craig Blue

Budget Figures for Asbestos Consultant - Inspection

Task #1 – Building Inspection*	Time	Rate	Total
Field time to inspect and measure ceiling tile, fireproofing, and wall construction of areas affected by renovation.	100 hours	$55/hour	5,500.00
Pre-renovation report preparation and assembly	8 hours		440.00
Final report preparation and assembly (post abatement)	16 hours		880.00
Analytical Charges @ $25.00/sample, plus 10% equipment charge (copper tubes, etc.)**	N/A	39 samples	1,072.50
Total Consulting Costs			**7,892.50**

*I propose that in order to lower the cost of this building inspection and expedite the process of obtaining information on the materials that need to be abated, that the inspection be performed in two phases:

- The first phase of the report would include inspecting the ceiling tile, area above ceiling tile for fireproofing, and wall construction in order to ascertain asbestos content and square footage of material to be removed before the sprinkler system upgrade project. A partial, pre-renovation inspection report would be completed for this part of the project.
- The second phase of the inspection will be performed in conjunction with monitoring time on site during the abatement. This phase will cover the suspect asbestos-containing materials within the building that would not be affected by the abatement process. After the abatement is completed, a complete building inspection report will be produced.

Time spent on site for monitoring will also be used to complete the inspection report, thus saving the University some consulting charges while already on site.

**The inspection budget figure for analytical charges does not include samples that may need to be point counted. If point counting is required, you will be notified first before any work is done.

Budget Figures for Asbestos Consultant - Abatement

Task #1 – Project Design, Specifications, Bid Walk	**Time**	**Rate**	**Total**
Development of scope of work – project design	40 hours	$55/hour	2,200.00
Preparation of scope of work and specifications	20 hours		1,100.00
Bid package preparation and printing	10 hours		550.00
Bid walk with abatement contractors, addendum preparation, etc.	12 hours		660.00
Task #2 – Project Monitoring: (< full time)*			
Phase 1 Phases 2-9 (@ 60 hours/phase) Phase 10	45 hours 480 hours 45 hours		31,350.00
Analytical Sampling – rush basis, assuming 4 samples per day ($20/ea) plus 10% equipment and cassette charge @0.50/each**	N/A	220 samples @ $20/sample	5,060.00
Total Consulting Costs			**40,920.00**

*Project Monitoring time allowed on site will also be spent completing the phase 2 portion of the building inspection.

** Air monitoring within this building should be performed inside containment, outside containment, above and below containment on a daily basis. The air monitoring analytical charges do not include a laboratory surcharge in the event that samples will need to be analyzed after-hours or on weekends.

Budget Figures for Asbestos Consultant – Extra Charges Covered By Other Than Building Owner

Task #1 – OSHA 2-Hour Asbestos Awareness Training	**Time**	**Rate**	**Total**
Class Preparation and teaching time, including materials.	10 hours	$55/hour	550.00
Task #2 – Air Monitoring on Sprinkler System and Other Workers			
Phase 1 – Consultant Time Phase 2 – Consultant Time	20 hours 20 hours		2,200.00
Analytical Sampling – rush basis, assuming 2 samples per day ($20/ea) plus 10% equipment and cassette charge @ 0.50/each	N/A	30 samples @ $20/sample	675.00
Total Consulting Costs			**3,425.00**

If you have any questions regarding the contents of this proposal, please don't hesitate to give me a call at 801-391-5219, or at my home office at 278-1074. Thank you for the opportunity to prepare this information for you.

Sincerely,

Robyn Wilson, President
Wilson Consulting Services, Inc.

Appendix A

Cost Estimate

Cost Estimate for College of Nursing at Univ. of Utah (PHASE I)

The costs listed below are for the work related to seismic upgrade only

	Typical Costs			
CF	Concrete Foundation Work (cu yd)	900	$	600.00
HP	Helical Piers (each)	2300	$	2,300.00
CS	12" concrete Shearwall (sq ft)	25	$	30.00
ST	Cost per lb of steel (installed)	2	$	2.50
FW	5/16" fillet weld (per inch)	1.5	$	1.50
D	Arch, Mecha and Elec Demolition	5	$	8.00
A	Arch, Mech and Elec Put Back (sq ft floor space)	30	$	20.00
W	Wall put back (lin ft)	150	$	150.00
DS	Drag Struts (lin ft)	200	$	200.00
BFC	Braced frame connections at floor (each)	750	$	750.00
EWD	Exterior Wall demolition	8	$	8.00
EWF	Exterior Wall put back	25	$	45.00
RDC	Roof Diaphragm Connectios (lin ft)	35	$	200.00

Building

		Quantity	Units		Cost/unit		Cost
Braced Frames							
Anchor Bolts		48	bolts	$	150.00	$	7,200.00
New Braced Frame Steel	ST	17072	lbs steel	$	2.50	$	42,680.00
Welds for BF connection	FW	2688	inches	$	1.50	$	4,032.00
Gussets		2656	lbs steel	$	2.00	$	5,312.00
Diphragm Connection	RDC	228	lin ft	$	200.00	$	45,600.00
Footing and Foundation							
New Footing at BF(Augmentation)	CF	256	Cu Yds	$	600.00	$	153,600.00
		0	Cu Yds	$	-	$	-
InFill Floor at Braced Frames		740	sq ft	$	230.00	$	170,200.00
	ST	0	lbs steel	$	2.50	$	-
Concrete Shear Wall							
Wall Concrete	CS	350	sq ft	$	30.00	$	10,500.00
New Footing at CW(Augmentation)	CF	10.4	Cu Yds	$	600.00	$	6,240.00
New SOB	CF	3.7	Cu Yds	$	600.00	$	2,220.00
Diphragm Connection	RDC	30	lin ft	$	200.00	$	6,000.00
Demolition and Replace							
Demo Existing SOG		300	sq ft	$	2.00	$	600.00
Demo existing Masonry Wall	EWD	1190	sq ft	$	8.00	$	9,520.00
Demo Existing arch ceiling	D	1780	sq ft	$	8.00	$	14,240.00
		0	lin ft	$	-	$	-
Replace Slab on Grade		300	sq ft	$	4.00	$	1,200.00
Replace Existing Ext Wall	EWF	1190	sq ft	$	45.00	$	53,550.00

R E & A

Replace Ceiling	A	1780	sq ft	$	20.00	$	35,600.00
		0		$	-	$	-
Misc/Mech/Elec/Plumb		1	lump	$	12,000.00	$	12,000.00
Public Barricades and Protection	PB	1	allowance	$	10,000.00	$	10,000.00
						$	**590,294.00**
Total Area of the Building		120807	sq ft			**$**	**4.89**

Note:
The cost listed above are not included the items as follows; the new additions at the south and north entry, the architectural interior remodel, the infill of existing stair, mechanical and electrical work relating to the listed item above; mobilization, overhead, profit, design fee, and special inspection.

Cost Estimate for College of Nursing at Univ. of Utah (PHASE II)

The costs listed below are for the work related to seismic upgrade only

	Typical Costs			
CF	Concrete Foundation Work (cu yd)	900	$	600.00
HP	Helical Piers (each)	2300	$	2,300.00
CS	12" concrete Shearwall (sq ft)	25	$	30.00
ST	Cost per lb of steel (installed)	2	$	2.50
FW	5/16" fillet weld (per inch)	1.5	$	1.50
D	Arch, Mecha and Elec Demolition	5	$	8.00
A	Arch, Mech and Elec Put Back (sq ft floor space)	30	$	20.00
W	Wall put back (lin ft)	150	$	150.00
DS	Drag Struts (lin ft)	200	$	200.00
BFC	Braced frame connections at floor (each)	750	$	750.00
EWE	Exterior Wall demolition	8	$	8.00
EWF	Exterior Wall put back	25	$	45.00
RDC	Roof Diaphragm Connectios (lin ft)	35	$	200.00

Building

		Quantity	Units		Cost/unit		Cost
Braced Frames							
Anchor Bolts		0	bolts	$	150.00	$	-
New Braced Frame Steel	ST	30519	lbs steel	$	2.50	$	76,297.50
Welds for BF connection	FW	18816	inches	$	1.50	$	28,224.00
Gussets		8010	lbs steel	$	2.00	$	16,020.00
Diphragm Connection	RDC	752	lin ft	$	200.00	$	150,400.00
Footing and Foundation							
New Footing at BF(Augmentation)	CF	0	Cu Yds	$	600.00	$	-
		0	Cu Yds	$	-	$	-
InFill Floor at Braced Frames		1110	sq ft	$	230.00	$	255,300.00
	ST	0	lbs steel	$	2.50	$	-
Concrete Shear Wall							
Wall Concrete	CS	1050	sq ft	$	30.00	$	31,500.00
New Footing at CW(Augmentation)	CF	0	Cu Yds	$	600.00	$	-
New SOB	CF	0	Cu Yds	$	600.00	$	-
Diphragm Connection	RDC	120	lin ft	$	200.00	$	24,000.00
Demolition and Replace							
Demo Existing SOG		0	sq ft	$	2.00	$	-
Demo existing Masonry Wall	EWE	2390	sq ft	$	8.00	$	19,120.00
Demo Existing arch ceiling	D	4820	sq ft	$	8.00	$	38,560.00
		0	lin ft	$	-	$	-
Replace Slab on Grade		0	sq ft	$	4.00	$	-
Replace Existing Ext Wall	EWF	2390	sq ft	$	45.00	$	107,550.00
Replace Ceiling	A	4820	sq ft	$	20.00	$	96,400.00
		0		$	-	$	-
'Mech/Elec/Plumb		1	lump	$	12,000.00	$	12,000.00

R E & A

Public Barricades and Protection	PB	0	allowance	$ 10,000.00	$	-
					$	**855,371.50**
Total Area of the Building		120807	sq ft		**$**	**7.08**

Note:
The cost listed above are not included the items as follows; the new additions at the south and north entry, the architectural interior remodel, the infill of existing stair, mechanical and electrical work relating to the listed item above; mobilization, overhead, profit, design fee, and special inspection.

R E
& A

Appendix B

ASCE/SEI 31-03 Checklist

3.7.3 Basic Structural Checklist for Building Type S1: Steel Moment Frames with Stiff Diaphragms

This Basic Structural Checklist shall be completed where required by table 3-2.

Each of the evaluation statements on this checklist shall be marked Complaint (C), Non-compliant (NC), or Not Applicable (N/A) for Tier 1 Evaluation. Compliant statements identify issues that are acceptable according tot eh criteria of this standard, while non-compliant statements identify issues that require further investigation. Certain statements may not apply to the buildings being evaluated. For non-compliant evaluation statements, the design professional may choose to conduct further investigation using the corresponding Tier 2 Evaluation procedure; corresponding section numbers are in parentheses following each evaluation statement.

C3.7.3 Basic Structural Checklist for Building Type S1

These buildings consist of a frame assembly of steel beams and steel columns. Floor and roof framing consists of cast-in-place concrete slabs or metal deck with concrete fill supported on steel beams, open web joists, steel trusses. Lateral forces are resisted by steel moment frames that develop their stiffness through rigid or semi-rigid beam-column connections. Where all connections are moment-resisting connection, the entire frame participates in lateral force resistant. Where only selected connections are moment-resisting connections, resistance is provided along discrete frame lines. Columns are oriented so that each principal direction of the building has columns resisting forces in strong axis bending. Diaphragms consist of concrete or metal deck with concrete fill and are stiff relative tot eh frames. Where the exterior of the structure is concealed, walls consist of metal panel curtain walls, glazing, brick masonry, or precast concrete panels. Where the interior of the structure is finished, frames are concealed by ceilings, partition walls, and architectural column furring. Foundations consist of concrete spread footings or deep pile foundations.

Building System

C	(NC)	N/A	LOAD PATH: The structure shall contain a minimum of one complete load path for Life Safety and Immediate Occupancy for seismic force effects from any horizontal direction that serves to transfer the inertial forces from the mass to the foundation (Tier 2: Sec. 4.3.1.1)
(C)	NC	N/A	ADJACENT BUILDINGS: The clear distance between the building being evaluated and any adjacent building shall be greater than 4 percent of the height of the shorter building for Life Safety and Immediate Occupancy. (Tier 2: Sec. 4.3.1.2)
C	NC	(N/A)	MEZZANINES: Interior mezzanine levels shall be braced independently from the main structure, or shall be anchored to the lateral-force-resisting elements of the main structure. (Tier 2: Sec. 4.3.1.3)
(C)	NC	N/A	WEAK STORY: The strength of the lateral-force-resisting system in any story shall not be less than 80% of the strength in an adjacent story above or below for Life-Safety and Immediate Occupancy.. (Tier 2: Sec. 4.3.2.1)
(C)	NC	N/A	SOFT STORY: The stiffness of the lateral-force-resisting system in any story shall not be less than 70% of the lateral-force-resisting system stiffness in an adjacent story above or below or less than 80% of the average stiffness of the three stories above or below for Life-Safety and Immediate Occupancy. (Tier 2: Sec. 4.3.2.2.)
(C)	NC	N/A	GEOMETRY: There shall be no changes in horizontal dimension of the lateral-force-resisting system of more than 30% in a story relative to adjacent stories for Life Safety and Immediate Occupancy, excluding one-story penthouses and mezzanines. (Tier 2:

			Sec. 4.3.2.3)
C	NC	N/A	VERTICAL DISCONTINUITIES: All vertical elements in the lateral-force-resisting system shall be continuous to the foundation. (Tier 2: Sec. 4.3.2.4)
C	NC	N/A	MASS: There shall be no change in effective mass more than 50% from one story to the next for Life Safety and Immediate Occupancy. Light roofs, penthouses, and mezzanines need not be considered. (Tier 2: Sec. 4.3.2.5)
C	NC	N/A	TORSION: The estimated distance between the story center of mass and the story center of rigidity shall be lass than 20 percent of the building width in either plan dimension for Life Safety and Immediate Occupancy. (Tier 2: Sec. 4.3.3.3)
C	NC	N/A	DETERIORATION OF STEEL: There shall be no visible rusting, corrosion, cracking or other deterioration in any of the steel elements or connections in the vertical- or lateral-force-resisting systems. (Tier 2: Sec. 4.3.3.3)
C	NC	N/A	DETERIORATION OF CONCRETE: There shall be no visible deterioration of concrete or reinforcing steel in any of the vertical-or lateral-forcing-resisting elements. (Tier 2: Sec. 4.3.3.4)

Lateral Force Resisting System

C	NC	N/A	REDUNDANCY: The number of lines of moment frames in each principle direction shall be greater than or equal 2 for Life Safety and Immediate Occupancy. The number of bays of moment frames in each line shall be greater than 2 of Life Safety and 3 for Immediate Occupancy. (Tier 2: Sec. 4.4.1.3.2)
C	NC	N/A	INTERFERING WALLS: All concrete and masonry infill walls placed in moment frames shall be isolated from structural elements. (Tier 2: Sec. 4.4.1.2.1)
C	NC	N/A	DRIFT CHECK: The drift ratio of the steel moment frames, calculated using the Quick Check procedure of Section 3.4.3.1, shall be less than 0.025 for Life Safety and 0.015 for Immediate Occupancy. (Tier 2: Sec. 4.4.1.3.1)
C	NC	N/A	AXIAL STRESS CHECK: The axial stress due to gravity loads in columns subjected to overturning forces shall be less than $0.10F_y$ for Life Safety and Immediate Occupancy. Alternatively, the axial stress due to overturning forces alone, calculated using the Quick Check Procedure of Section 3.5.3.6, shall be less than $0.30F_y$ for Life Safety and Immediate Occupancy. (Tier 2: Sec. 4.4.1.3.2)

Connections

C	NC	N/A	TRANSFER TO STEEL FRAMES: Diaphragms shall be connected for transfer of loads to the steel frames for Life Safety and the connections shall be able to develop the lesser of the strength of the frames or the diaphragms for Immediate Occupancy. (Tier 2: Sec. 4.6.2.2)
C	NC	N/A	STEEL COLUMNS: The columns in lateral-force-resisting frames shall be anchored to the building foundation for Life Safety and the anchorage shall be able to develop the lesser of the tensile capacity of the column, the tensile capacity of the lowest level column splice (if any), or the uplift capacity of the foundation, for Immediate Occupancy. (Tier 2: Sec. 4.6.3.1)

3.7.3S Supplemental Structural Checklist For Building Type S1: Steel Moment Frames With Stiff Diaphragms

This Supplemental Structural Checklist shall be completed when required by Table 3-2. The Basic Structural Checklist shall be completed prior to completing this Supplemental Structural Checklist.

Lateral Force Resisting System

C	NC	N/A	MOMENT-RESISTING CONNECTIONS: All moment connections shall be able to develop the strength of the adjoining members or panel zones. (Tier 2: Sec. 4.4.1.3.3)
(C)	NC	N/A	PANEL ZONES: All panel zones shall have the shear capacity to resist the shear demand required to develop0.8 times the sum of the flexural strengths of the girders framing in at the face of the column. (Tier 2 Sec. 4.4.1.3.4)
(C)	NC	N/A	COLUMN SPLICES: All column splice details located in moment-resisting frames shall include connection of both flanges and the web for Life Safety, and the splice shall develop the strength of the column for Immediate Occupancy. (Tier 2: Sec. 4.4.1.3.5
C	(NC)	N/A	STRONG COLUMN/WEAK BEAM: The percentage of strong column/weak beam joints in each story of each line of moment-resisting frames shall be greater than 50 percent for Life Safety and Immediate Occupancy. (Tier 2 Sec. 4.4.1.3.6)
C	(NC)	N/A	COMPACT MEMBERS: All frame elements shall meet section requirements set forth by Seismic Provisions for Structural Steel Buildings Table I-9-1 (AISC, 1997). (Tier 2: Sec. 4.4.1.3.7)
C	NC	(N/A)	BEAM PENETRATIONS: All openings in frame-beam webs shall be less than ¼ of the beam depth and shall be located in the center half of the beams. This statement shall apply to the Immediate Occupancy Performance Level only. (Tier 2: Sec. 4.4.1.3.9)
C	NC	(N/A)	GIRDER FLANGE CONTINUITY PLATES: There shall be girder flange continuity plates at all moment-resisting frame joints. This statement shall apply tot eh Immediate Occupancy Performance Level only. (Tier 2: Sec. 4.4.1.3.8)
C	NC	(N/A)	OUT-OF-PLANE BRACING: Braced frame connections attached to beam bottom flanges located away from beam-column joints shall be braced out-of-plane at the bottom flange of the beams. This statement shall apply to the Immediate Occupancy Performance Level only. (Tier 2: Sec. 4.4.3.1.6)
C	NC	(N/A)	BOTTOM FLANGE BRACING: The bottom flanges of beams shall be braced out-of-plane. This statement shall apply to the Immediate Occupancy Performance Level only. (Tier 2: Sec. 4.4.1.3.11)

Diaphragms

C	NC	(N/A)	PLAN IRREGULATIES: There shall be tensile capacity to develop the strength of the diaphragm at re-entrant corners or other locations of plan irregularities. This statement shall apply to the Immediate Occupancy Performance Level only. (Tier 2: Sec. 4.5.1.7)
C	NC	(N/A)	DIAPHRAGM REINFORCEMENT AT OPENINGS: There shall be reinforcing around all diaphragm openings larger than 50 percent of the width in either major plan dimension. This statement shall apply to the Immediate Occupancy Performance Level only. (Tier 2: Sec. 4.5.1.8)

Connections

C	NC	(N/A)	UPLIFT AT PILE CAPS: Pile caps shall have top reinforcement and piles shall be anchored to the pile caps for Life Safety, and the pile cap reinforcement and pile anchorage shall be able to develop the tensile capacity of the piles for Immediate Occupancy. (Tier 2: Sec. 4.6.3.10)

3.7.7 Basic Structural Checklist for Building Type S5: Steel Frames with Infill Masonry Shear Walls and Stiff Diaphragms

This Basic Structural Checklist shall be completed when required by Table 3-2.

Each of the evaluation statements on this checklist shall be marked compliant (C), non-compliant (NC), or not applicable (N/A) for a Tier 1 Evaluation. Compliant statements identify issues that are acceptable according to the criteria of this standard, while non-compliant statements identify issues that require further investigation. Certain statements may not apply to the buildings being evaluated. For non-compliant evaluation statements, the user may choose to conduct further investigation using the corresponding Tier 2 evaluation procedure; the section numbers in parentheses following each evaluation statement correspond to Tier 2 evaluation procedures.

C3.7.7 Basic Structural Checklist for Building Type S5

This is an older type of building construction that consists of a frame assembly of steel beams and steel columns. The floors and roof consist of cast-in-place concrete slabs or metal deck with concrete fill. Framing consists of steel beams, open web joists or steel trusses. Walls consist of infill panels constructed of solid clay brick, concrete block, or hollow clay tile masonry. Infill walls may completely encase the frame members, and present a smooth masonry exterior with no indication of the frame. The seismic performance of this type of construction depends on the interaction between the frame and infill panels. The combined behavior is more like a shear wall structure than a frame structure Solidly infilled masonry panels form diagonal compression struts between the intersections of the frame members. If the walls are offset from the frame and do not fully engage the frame members, the diagonal compression struts will not develop. The strength of the infill panel is limited by the shear capacity of the masonry bed joint or the compression capacity of the strut. The post-cracking strength is determined by an analysis of a moment frame that is partially restrained by the cracked infill. The diaphragms consist of concrete floors and are stiff relative to the walls.

Building System

(C) NC N/A — LOAD PATH: The structure shall contain one complete load path for Life Safety and Immediate Occupancy for seismic force effects from any horizontal direction that serves to transfer the inertial forces from the mass to the foundation. (Tier 2: Sec. 4.3.1.1)

C NC (N/A) — MEZZANINES: Interior mezzanine levels shall be braced independently from the main structure, or shall be anchored to the lateral-force-resisting elements of the main structure. (Tier 2: Sec. 4.3.1.3)

(C) NC N/A — WEAK STORY: The strength of the lateral-force-resisting system in any story shall not be less than 80% of the strength in an adjacent story above or below for Life-Safety and Immediate Occupancy. (Tier 2: Sec. 4.3.2.1)

(C) NC N/A — SOFT STORY: The stiffness of the lateral-force-resisting system in any story shall not be less than 70% of the stiffness in an adjacent story above or below or less than 80% of the average stiffness of the three stories above or below for Life-Safety and Immediate Occupancy. (Tier 2: Sec. 4.3.2.2)

(C) NC N/A — GEOMETRY: There shall be no changes in horizontal dimension of the lateral-force-resisting system of more than 30% in a story relative to adjacent stories for Life Safety and Immediate Occupancy, excluding one-story penthouses. (Tier 2: Sec. 4.3.2.3)

C (NC) N/A — VERTICAL DISCONTINUITIES: All vertical elements in the lateral-force-resisting system shall be continuous to the foundation. (Tier 2: Sec. 4.3.2.4)

North Masonry Shear Walls stop at parking level

(C) NC N/A MASS: There shall be no change in effective mass more than 50% from one story to the next for Life Safety and Immediate Occupancy. (Tier 2: Sec. 4.3.2.5)

(C) NC N/A TORSION: The distance between the story center of mass and the story center of rigidity shall be less than 20% of the building width in either plan dimension for Life Safety and Immediate Occupancy. (Tier 2: Sec. 4.3.2.6)

(C) NC N/A DETERIORATION OF STEEL: There shall be no visible rusting, corrosion, cracking, or other deterioration in any of the steel elements or connections in the vertical- or lateral-force-resisting systems. (Tier 2: Sec. 4.3.3.3)

(C) NC N/A DETERIORATION OF CONCRETE: There shall be no visible deterioration of concrete or reinforcing steel in any of the vertical- or lateral-force-resisting elements. (Tier 2: Sec. 4.3.3.4)

(C) NC N/A MASONRY UNITS: There shall be no visible deterioration of masonry units. (Tier 2: Sec. 4.3.3.7)

(C) NC N/A MASONRY JOINTS: The mortar shall not be easily scraped away from the joints by hand with a metal tool, and there shall be no areas of eroded mortar. (Tier 2: Sec.4.3.3.8)

(C) NC N/A CRACKS IN INFILL WALLS: There shall be no existing diagonal cracks in infill walls that extend throughout a panel, are greater than 1/8" for Life Safety and 1/16" for Immediate Occupancy, or have out-of-plane offsets in the bed joint greater than 1/8" for Life Safety and 1/16" for Immediate Occupancy. (Tier 2: Sec. 4.3.3.12)

Lateral Force Resisting System

(C) NC N/A REDUNDANCY: The number of lines of shear walls in each principal direction shall be greater than or equal to 2 for Life Safety and Immediate Occupancy. (Tier 2: Sec. 4.4.2.1.1)

C (NC) N/A SHEAR STRESS CHECK: The shear stress in the reinforced masonry shear walls, calculated using the Quick Check Procedure of Section 3.5.3.3, shall be less than 70 psi for Life Safety and Immediate Occupancy. (Tier 2: Sec. 4.4.2.4.1) 133 psi > 70 psi

C NC (N/A) SHEAR STRESS CHECK: The shear stress in the unreinforced masonry shear walls, calculated using the Quick Check procedure of Section 3.5.3.3, shall be less than 30 psi for clay units and 70 psi for concrete units for Life Safety and Immediate Occupancy. (Tier 2: Sec. 4.4.2.5.1)

(C) NC N/A WALL CONNECTIONS: Masonry shall be in full contact with frame for Life Safety and Immediate Occupancy. (Tier 2: Sec. 4.4.2.6.1)

Connections

(C) NC N/A TRANSFER TO SHEAR WALLS: Diaphragms shall be reinforced and connected for transfer of loads to the shear walls for Life Safety and the connections shall be able to develop the lesser of the shear strength of the walls or diaphragms for Immediate Occupancy. (Tier 2 Sec. 4.6.2.1)

(C) NC N/A STEEL COLUMNS: The columns in lateral-force-resisting frames shall be anchored to the building foundation for Life Safety and the anchorage shall be able to develop the lesser of the tensile capacity of the column, the column splice, or the foundation, for Immediate Occupancy. (Tier 2: Sec. 4.6.3.1)

3.7.7S Supplemental Structural Checklist for Building Type S5: Steel Frames with Infill Masonry Shear Walls and Stiff Diaphragms

This Supplemental Structural Checklist shall be completed when required by Table 3-2. The Basic Structural Checklist shall be completed prior to completing this Supplemental Structural Checklist.

Lateral Force Resisting System

C NC (N/A) REINFORCING AT OPENINGS: All wall openings that interrupt rebar shall have trim reinforcing on all sides. This statement shall apply to the Immediate Occupancy Performance Level only. (Tier 2: Sec. 4.4.2.4.3)

C (NC) N/A PROPORTIONS: The height-to-thickness ratio of the infill walls at each story shall be less than 9 for Life Safety in regions of high seismicity, 13 for Immediate Occupancy in regions of moderate seismicity, and 8 for Immediate Occupancy in regions of high seismicity. (Tier 2: Sec. 4.4.2.6.2)

13.75"×12/16" = 10.3 < 13

(C) NC N/A SOLID WALLS: The infill walls shall not be of cavity construction. (Tier 2: Sec. 4.4.2.6.3)

Diaphragms

C NC (N/A) PLAN IRREGULARITIES: There shall be tensile capacity to develop the strength of the diaphragm at re-entrant corners or other locations of plan irregularities. This statement shall apply to the Immediate Occupancy Performance Level only. (Tier 2: Sec. 4.5.1.7)

C NC (N/A) DIAPHRAGM REINFORCEMENT AT OPENINGS: There shall be reinforcing around all diaphragm openings larger than 50% of the building width in either major plan dimension. This statement shall apply to the Immediate Occupancy Performance Level only. (Tier 2: Sec. 4.5.1.8)

Connections

C (NC) N/A ANCHOR SPACING: Exterior ~~masonry~~ walls shall be anchored to the floor and roof systems at a spacing of 4 ft. or less for Life Safety and Immediate Occupancy. (Tier 2: Sec. 4.6.1.3)

C NC (N/A) LATERAL LOAD AT PILE CAPS: Pile caps shall have top reinforcement and piles shall be anchored to the pile caps for Life Safety, and the pile cap reinforcement and pile anchorage shall be able to develop the tensile capacity of the piles for Immediate Occupancy. (Tier 2: Sec. 4.6.3.10)

3.7.6 Basic Structural Checklist for Building Type S4: Steel Frames with Concrete Shear Walls

This Basic Structural Checklist shall be completed when required by Table 3-2.

Each of the evaluation statements on this checklist shall be marked compliant (C), non-compliant (NC), or not applicable (N/A) for a Tier 1 Evaluation. Compliant statements identify issues that are acceptable according to the criteria of this standard, while non-compliant statements identify issues that require further investigation. Certain statements may not apply to the buildings being evaluated. For non-compliant evaluation statements, the design professional may choose to conduct further investigation using the corresponding Tier 2 evaluation procedure; the section numbers in parentheses following each evaluation statement correspond to Tier 2 evaluation procedures.

C3.7.6 Basic Structural Checklist for Building Type S4

These buildings consist of a frame assembly of steel beams and steel columns. The floors and roof consist of cast-in-place concrete slabs or metal deck with or without concrete fill. Framing consists of steel beams, open web joists or steel trusses. Lateral forces are resisted by cast-in-place concrete shear walls. These walls are bearing walls when the steel frame does not provide a complete vertical support system. In older construction the steel frame is designed for vertical loads only. In modern dual systems, the steel moment frames are designed to work together with the concrete shear walls in proportion to their relative rigidity. In the case of a dual system, the walls shall be evaluated under this building type and the frames shall be evaluated under S1 or S1A, Steel Moment Frames. Diaphragms consist of concrete or metal deck with or without concrete fill. The steel frame may provide a secondary lateral-force-resisting system depending on the stiffness of the frame and the moment capacity of the beam-column connections.

Building System

(C) NC N/A — LOAD PATH: The structure shall contain one complete load path for Life Safety and Immediate Occupancy for seismic force effects from any horizontal direction that serves to transfer the inertial forces from the mass to the foundation. (Tier 2: Sec. 4.3.1.1)

C NC (N/A) — MEZZANINES: Interior mezzanine levels shall be braced independently from the main structure, or shall be anchored to the lateral-force-resisting elements of the main structure. (Tier 2: Sec. 4.3.1.3)

(C) NC N/A — WEAK STORY: The strength of the lateral-force-resisting system in any story shall not be less than 80% of the strength in an adjacent story above or below for Life-Safety and Immediate Occupancy. (Tier 2: Sec. 4.3.2.1)

(C) NC N/A — SOFT STORY: The stiffness of the lateral-force-resisting system in any story shall not be less than 70% of the stiffness in an adjacent story above or below or less than 80% of the average stiffness of the three stories above or below for Life-Safety and Immediate Occupancy. (Tier 2: Sec. 4.3.2.2)

(C) NC N/A — GEOMETRY: There shall be no changes in horizontal dimension of the lateral-force-resisting system of more than 30% in a story relative to adjacent stories for Life Safety and Immediate Occupancy, excluding one-story penthouses. (Tier 2: Sec. 4.3.2.3)

(C) NC N/A — VERTICAL DISCONTINUITIES: All vertical elements in the lateral-force-resisting system shall be continuous to the foundation. (Tier 2: Sec. 4.3.2.4)

C NC N/A — MASS: There shall be no change in effective mass more than 50% from one story to the next for Life Safety and Immediate Occupancy. (Tier 2: Sec. 4.3.2.5)

C NC N/A — TORSION: The distance between the story center of mass and the story center of rigidity shall be less than 20% of the building width in either plan dimension for Life Safety and Immediate Occupancy. (Tier 2: Sec. 4.3.2.6)

C NC N/A — DETERIORATION OF STEEL: There shall be no visible rusting, corrosion, cracking, or other deterioration in any of the steel elements or connections in the vertical- or lateral-force-resisting systems. (Tier 2: Sec. 4.3.3.3)

C NC N/A — DETERIORATION OF CONCRETE: There shall be no visible deterioration of concrete or reinforcing steel in any of the vertical- or lateral-force-resisting elements. (Tier 2: Sec. 4.3.3.4)

C NC N/A — CONCRETE WALL CRACKS: All existing diagonal cracks in wall elements shall be less than 1/8" for Life Safety and 1/16" for Immediate Occupancy, shall not be concentrated in one location, and shall not form an X pattern. (Tier 2: Sec. 4.3.3.9)

Lateral Force Resisting System

C NC N/A — COMPLETE FRAMES: Steel or concrete frames classified as secondary components shall form a complete vertical load carrying system. (Tier 2: Sec. 4.4.1.6.1)

C NC N/A — REDUNDANCY: The number of lines of shear walls in each principal direction shall be greater than or equal to 2 for Life Safety and Immediate Occupancy. (Tier 2: Sec. 4.4.2.1.1)

C NC N/A — SHEAR STRESS CHECK: The shear stress in the concrete shear walls, calculated using the Quick Check procedure of Section 3.5.3.3, shall be less than 100 psi or $2\sqrt{f'_c}$ for Life Safety and Immediate Occupancy. (Tier 2: Sec. 4.4.2.2.1)

C NC N/A — REINFORCING STEEL: The ratio of reinforcing steel area to gross concrete area shall be greater than 0.0015 in the vertical direction and 0.0025 in the horizontal direction for Life Safety and Immediate Occupancy. The spacing of reinforcing steel shall be equal to or less than 18" for Life Safety and Immediate Occupancy. (Tier 2: Sec. 4.4.2.2.2)

C NC N/A — COLUMN SPLICES: Steel columns encased in shear wall boundary elements shall have splices that develop the tensile strength of the column. This statement shall apply to the Immediate Occupancy Performance Level only. (Tier 2: Sec. 4.4.2.2.9)

Connections

C NC N/A — TRANSFER TO SHEAR WALLS: Diaphragms shall be reinforced and connected for transfer of loads to the shear walls for Life Safety and the connections shall be able to develop the lesser of the shear strength of the walls or diaphragms for Immediate Occupancy. (Tier 2 Sec. 4.6.2.1)

C NC N/A — FOUNDATION DOWELS: Walls shall be doweled into the foundation for Life Safety and the dowels shall be able to develop the lesser of the strength of the walls or the weight of the foundations for Immediate Occupancy. (Tier 2: Sec. 4.6.3.5)

C NC N/A — SHEAR-WALL-BOUNDARY COLUMNS: The shear wall boundary columns shall be anchored to the building for Life Safety and the anchorage shall be able to develop the tensile capacity of the column for Immediate Occupancy. (Tier 2: Sec.4.6.3.6)

3.7.6S Supplemental Structural Checklist for Building Type S4: Steel Frames with Concrete Shear Walls

This Supplemental Structural Checklist shall be completed when required by Table 3-2. The Basic Structural Checklist shall be completed prior to completing this Supplemental Structural Checklist.

Lateral Force Resisting System

C (NC) N/A — COUPLING BEAMS: The stirrups in all coupling beams over means of egress shall be spaced at or less than d/2 and shall be anchored into the core with hooks of 135° or more for Life Safety and Immediate Occupancy. In addition, the beams shall have the capacity in shear to develop the uplift capacity of the adjacent wall for Immediate Occupancy. (Tier 2: Sec. 4.4.2.2.3)

C NC (N/A) — OVERTURNING: All shear walls shall have aspect ratios less than 4 to 1. Wall piers need not be considered. This statement shall apply to the Immediate Occupancy Performance Level only. (Tier 2: Sec. 4.4.2.2.4)

C NC (N/A) — CONFINEMENT REINFORCING: For shear walls with aspect ratios greater than 2.0, the boundary elements shall be confined with spirals or ties with spacing less than 8 d_b. This statement shall apply to the Immediate Occupancy Performance Level only. (Tier 2: Sec. 4.4.2.2.5)

C NC (N/A) — REINFORCING AT OPENINGS: There shall be added trim reinforcement around all wall openings. This statement shall apply to the Immediate Occupancy Performance Level only. (Tier 2: Sec. 4.4.2.2.6)

(C) NC N/A — WALL THICKNESS: Thickness of bearing walls shall not be less than 1/25 the minimum unsupported height or length, nor less than 4". This statement shall apply to the Immediate Occupancy Performance Level only. (Tier 2: Sec. 4.4.2.2.7)

(C) NC N/A — WALL CONNECTIONS: There shall be a positive connection between the shear walls and the steel beams and columns for Life Safety and the connection shall be able to develop the strength of the walls for Immediate Occupancy. (Tier 2: Sec. 4.4.2.2.8)

Diaphragms

(C) NC N/A — OPENINGS AT SHEAR WALLS: Diaphragm openings immediately adjacent to the shear walls shall be less than 25% of the wall length for Life Safety and 15% of the wall length for Immediate Occupancy. (Tier 2: Sec. 4.5.1.4)

(C) NC N/A — PLAN IRREGULARITIES: There shall be tensile capacity to develop the strength of the diaphragm at re-entrant corners or other locations of plan irregularities. This statement shall apply to the Immediate Occupancy Performance Level only. (Tier 2: Sec. 4.5.1.7)

(C) NC N/A — DIAPHRAGM REINFORCEMENT AT OPENINGS: There shall be reinforcing around all diaphragm openings larger than 50% of the building width in either major plan dimension. This statement shall apply to the Immediate Occupancy Performance Level only. (Tier 2: Sec. 4.5.1.8)

Connections

C NC (N/A) — LATERAL LOAD AT PILE CAPS: Pile caps shall have top reinforcement and piles shall be anchored to the pile caps for Life Safety, and the pile cap reinforcement and pile anchorage shall be able to develop the tensile capacity of the piles for Immediate Occupancy. (Tier 2: Sec. 4.6.3.10)